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See Advert. Page 27



"THE TIMES" OF THE TRANSPORT WORLD

NEW  
COMMERCIAL  
VEHICLE  
MODELS

See Pages 5, 7, etc.

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LONDON, SEPTEMBER 13, 1958

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## The T.U.C. at Bournemouth

CONDEMNING the recent report of the Cohen Committee the Trades Union Congress at Bournemouth last week decided to continue its opposition to wage restraint. Its dislike of a realistic examination of wage problems is in line with its attitude to a long-term report on the country's economic position, prepared some two years ago under T.U.C. auspices and shelved because it was unpalatable. Nevertheless, plenty of home-truths were forthcoming and Mr. Alan Birch, chairman of the General Council's economic committee, in stating that expansion of production was the way to raise the workers' living standards, expressed the view that though they had a good record of increasing productivity they too often regarded co-operation as a concession to employers and not as something in their own interests. Neither Government nor Cohen Committee condemns expansionism but each insists that it should be pursued with caution. This, however, did not prevent the Congress passing resolutions condemning the Government's economic policy because it was restrictionist rather than expansionist and instructing the General Council to prepare its own report on the economic condition of the country. Another resolution called on the General Council to raise with the Government the functioning of collective bargaining machinery in the nationalised industries and public services. Mr. Frank Cousins attributed the unsatisfactory outcome of negotiations in the recent London bus dispute to Government interference. His union, he said, did not challenge the elected Government, but that did not mean that the latter's views were sacrosanct.

## Unions and Nationalised Boards

AMONG those objecting to central co-ordination of wages policy was Mr. W. J. P. Webber (Transport Salaried Staffs' Association), who said that the proposal should be rejected unless and until the affiliated unions were ready to surrender their autonomy, not only in the calling of strikes but in the character and timing of their wage claims. It would be wrong and dangerous, he exclaimed, for the General Council to support claims and call on other unions to help, perhaps withdrawing labour over a wide field. The unions would not be prepared to give blank cheques without regard to their own agreements and rules or the interests of their own members. Dissatisfaction with the conduct of nationalised industries was shown by the adoption of a motion declaring that only those with a belief in the necessity and value of nationalised industry should be appointed to the boards and that representations to this end should be made to any future Labour Government. Mr. A. K. M. Milner (Association of Supervisory Staffs, Executives and Technicians), in moving the resolution, claimed that in 1956, of the 272 seats on the boards of nationalised industries, 106 or 39 per cent were held by company directors in private industry. A further 26 per cent were held by representatives of top management and only 17 per cent had any connection with the Labour movement. Thirty insurance companies had 49 seats on the boards; 18 banks had 31 seats, and every year under the Conservative Government the position became worse. In other surroundings this might have been regarded as a fairly comprehensive cross-section of business talent, but the value of the statement may be assessed from the fact that the seconder sweepingly asserted that it was generally recognised that 90 per cent of management in Britain was inefficient!

## Quick Baptism

HARDLY had the new teleprinter service on the London, Tilbury and Southend Line of the Eastern Region become available than it had, not its baptism of fire, but an almost literal baptism in the violent storm of tropical intensity which swept southern Britain on September 5, leaving a trail of interrupted rail and road communications. The teleprinter, located at the new control room of the L.T.S. Line (which will

shortly be described in our pages), is intended to give news to stations down the line, and proved invaluable in setting out emergency train services and their bus connections and in advising Southend passengers to travel temporarily on the Liverpool Street route. Receiving instruments of the teleprinter circuit are placed at 22 strategic points between Fenchurch Street and Shoeburyness and will soon be installed at five others. The system has quickly justified its existence. Tribute should be paid also to the devoted work of railwaymen in getting

populated districts now that suitable vehicles are available. It will be a pity if a way cannot be found of putting them to work profitably to provide services where there have previously been none or existing unprofitable services are being withdrawn. It would help to stop the continuing drift from rural areas, although the fuel tax abolition suggested by the bus companies would have been a simpler solution. For the rest, hotels, schools and similar institutions may find the microbus invaluable as a means of overcoming their present doubtful legal position

## CURRENT TOPICS

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passengers home and in carrying out extensive repairs at high speed (the Southern Region was interrupted in 15 places) and no less to the untiring efforts of their bus colleagues who in many cases were up all night seeing that passengers got through to destination despite the need to traverse unfamiliar roads, themselves often damaged or cluttered by stranded vehicles. In Essex, Army lorries also performed invaluable work in fording deep flood water with travellers who would otherwise have been left anything but high and dry.

## A Place for the Small Bus?

FAITH in the future of the small bus based on popular goods-van chassis is implied by the recent commissioning by Kenex, Limited, of a new 35,000-sq. ft. factory in Dover equipped principally for the production of such vehicles. Originator of the purchase-tax-free conversion in 1951—an astute piece of legal interpretation that was quickly imitated by various other coach-builders—and assiduous campaigner with the authorities for the admission of these potentially useful vehicles to legal operation for hire or reward, the Kenex company was also first to introduce an 11-seat bus—the Kenecoach—complying with the amended public service vehicle regulations, as we recorded in our issue for May 10. Workmanship in the Kenecoach is sound and the company manufactures its own seats, including the frames, to ensure optimum comfort and use of space. The new factory has an output capacity of some scores of completed vehicles a week and since several other manufacturers have also now introduced small-capacity buses complying with p.s.v. requirements, it is pertinent to ask where all these vehicles will find a market. Certainly, established bus operators have shown little or no interest in them, nor seem likely to for a number of fairly obvious reasons. Perhaps, as the Ministry of Transport appears to envisage, a new type of part-time bus operation will develop in thinly

when using vehicles not designed to comply with passenger-carrying regulations.

## The Right Size for the Job

CONFIRMATION of the editorial view which was expressed most recently in our last issue, that the very large jet air liners which are now appearing might not necessarily suit everyone, was forthcoming on September 5. Air Commodore Juan Jose Guiraldes, the president of Aerolineas Argentinas, explained the reasons for his airline's decision to order de Havilland Comet 4 machines for its international services. The aircraft, which would operate as a 67-seater (23 first class and 44 tourist), was just about the right size for the services. Plans provided for utilisation of the three Comets on a basis of 9 hr. 20 min. per aircraft per day from May, 1959, to April, 1960. There would be four flights weekly between Buenos Aires and New York, two weekly between Buenos Aires and London, and one a day between Buenos Aires and Santiago de Chile. From June, 1960, all six aircraft would be available and, subject to permission, the New York service would increase to a daily one and that to London to four a week. The first crews are to be trained in England by arrangement with de Havilland, and subsequent training will be carried out at Buenos Aires. Maintenance will also be done there, initially under de Havilland supervision, but the major overhaul of the turbines will be carried out by Rolls-Royce in England until the Aerolineas Argentinas staff is fully trained.

## London Midland Electrification

"OFF like a flash" is a good old Army phrase which has some pertinence in connection with the London Midland Region's electrification schemes. Really good progress is being made with the pioneer stage between Manchester and Crewe and civil engineering work has now advanced to the point where it has been necessary to allow more time for all trains between London and

Crewe because of permanent way slacks. As Mr. David Blee, London Midland general manager, said last week, the process is tantamount to building a new railway while the old railway—and one of the busiest in the world—is still there. Between London and Crewe 2½ million tons of new ballast are being employed to improve the roadbed, with 82½ miles of new drains; for the clearances needed by 25,000-volt equipment 568 bridges have to be raised and 45 tunnels modified; some 350 underbridges require attention. Telecommunication circuits have to be removed from poles and cabled to avoid inductive interference and opportunity is being taken to resignal the railway and improve the track layout. There will be concentration on fewer signal boxes and new flying junctions will be introduced to reduce conflicting train movements. Stage two will be the line between Crewe and Liverpool and the third stage of the seven will connect Crewe with Birmingham. An outline of the new winter train service appears on page 15 where reference is also made to the Rolls-Royce-engined diesel suburban sets which at a cost of £2½ million will effect a quick betterment of suburban services from St. Pancras to Bedford and Barking.

## Silicon Rectifier for Traction

THE first silicon power rectifier to be used to convert electric power for traction service in Great Britain has been installed experimentally in a motor-coach on the Lancaster—Morecambe—Heysham line of the London Midland Region. This rectifier, made by British Thomson-Houston, represents a further pioneering step by British Railways in 50-cycle development. The coach in which the silicon rectifier has been installed has been operating successfully since December, 1955, with an equipment using germanium cells, also of B.T.H. manufacture; this has now been replaced. Whereas the original equipment comprised 600 germanium cells, the new rectifier embodies only 192 silicon cells of comparable unit size. This represents a substantial saving in size and weight. Moreover, the silicon cell can operate without danger at a considerably higher temperature than is permissible with a germanium cell.

## Hydraulic Buffers on Rolling Stock

EARLY in railway history Henry Booth of the Liverpool and Manchester, who had been associated with the Stephenson in the Rocket, invented the screw coupling. With the spring buffer this provided so satisfactory a means of connecting railway vehicles that as a result it is of comparatively recent years that reconsideration has been called for in this country. Need for improvement arises from the increased speed of freight services and the fitting of power brakes, as well as from the development of lightweight railcars. Indeed, the first prototype hydraulic buffers were tested by British Railways in 1952 and the lightweight aluminium unit then developed was adopted for railcars two years later. Then a heavy duty buffer to U.I.C. standards was produced by Oleo Pneumatics, Limited, with air-pressure recoil, nylon bearings and seals and built-in reservoir and some 12,000 are already in service. With 13-in. diameter head, a length of 24 in. and a stroke of 4½ in., it weighs 197 lb. and has an energy absorption of 600 inch-tons. The effects of spring fatigue are avoided; impact shocks are absorbed by oil resistance; resistance is constant throughout the stroke; characteristics may be varied by selection of a metering pin suited to the vehicle and loading conditions. An ample reserve of air and oil eliminates the need for replenishment while out on the line and maintenance, if needed, can be organised as a workshop job. Advantages of pneumatic-hydraulic buffers include reduction of damage to loads and rolling stock, the tare of which can be reduced, and the reduction of surge and snatch on the couplings of long trains. With an air pressure of 10 atmospheres, this type of buffer has been tested successfully at up to 93 million strokes.





The considerable savings and increased comfort of modern high speed diesel railcars are now being enjoyed by many people all over the world.

In Britain, over 98% of the British Railways lightweight multiple-unit stock incorporates B.U.T. power units, which are also used in Northern Ireland, Eire, Holland, Portugal and by British Overseas carriage builders supplying railways in Australia, India, Rhodesia, Nigeria, Norway, Egypt and South America.



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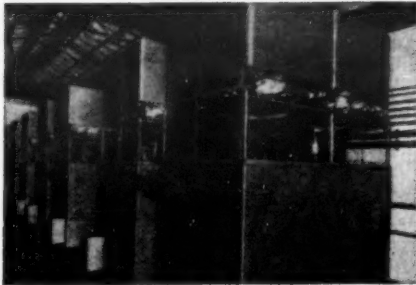
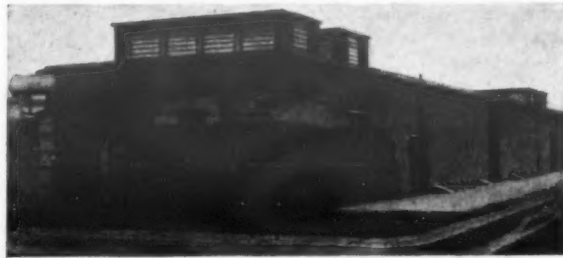
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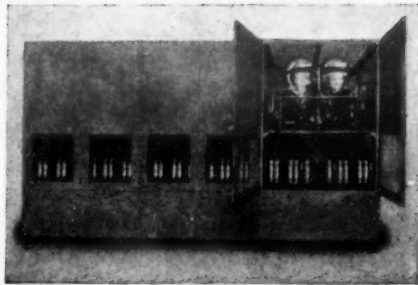
#### BRITISH RAILWAYS SOUTHERN REGION

One of 28 substations being equipped with Hewittic Rectifiers by the British Transport Commission for the Southern Region of British Railways. The photograph shows Wimbledon substation with one wall cut away to show the two 2,500 kW rectifiers in this half of the building.



#### LONDON TRANSPORT RAILWAYS

The 4,000 kW Bond Street substation, equipped exclusively with Hewittic Rectifiers. The plant comprises four 1,000 kW combined rectifier and enclosed air-cooled transformer units. This company is also responsible for the supply and installation of all A.C. and D.C. control gear. Some 90,000 kW Hewittic Rectifiers have been supplied to the London Transport Executive.



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The electrified section of the Canadian National Railways, comprising some 70 track miles in the vicinity of Montreal Terminal is supplied with D.C. by Hewittic Rectifiers in two 3,000 kW substations at Central Station and Saragway. The photograph shows one of the four 1,500 kW equipments in service. These are designed for operation at 3,000 volts, D.C.

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The Editor is prepared to consider contributions offered for publication in MODERN TRANSPORT, but intending contributors should first study the length and style of articles appearing in the paper and satisfy themselves that the topic with which they propose to deal is relevant to editorial requirements. In controversial subjects relating to all aspects of transport and traffic this newspaper offers a platform for independent comment and debate, its object being to encourage the provision of all forms of transport in the best interests of the community.

### Modernisation and Railway Economics

RAILWAYS in Spain have long enjoyed a close connection with the British railway manufacturing industry and delegates to the forthcoming meeting of the International Railway Congress Association in Madrid will, in the course of their travels, see equipment supplied well over half a century ago, as well as modern motive power and other items contributing to the success of the current railway modernisation schemes, which began in 1949 and which were the subject of special articles in our issues of September 8 and 15, 1956, and are again described in an article contributed by Señor Jose Puig Batet, general manager of the Red Nacional de los Ferrocarriles Españoles or Spanish National Railways. During 1957, despite several setbacks including bad weather, rises in prices and delivery difficulties, progress has continued in station and workshop improvements, electrification and resignalling. Nevertheless, despite traffic increases and a rise in rates and fares of 35 per cent on April 1, 1957, a loss approaching 2,000 millions of pesetas was incurred over the year. As modernisation develops, however, a further considerable increase in traffic may be expected. In 1957 there were over two million passengers more than in 1956, with a 2.8 per cent increase in passenger-kilometres. The commercial speed increased both for passenger and freight trains; ton-kilometres produced increased by over 10 per cent. Electrically-hauled ton-kilometres rose by 28 per cent. Some 39 oil-burning steam locomotives were added to stock, 24 diesel units were ordered, and delivery began of 60 large electric locomotives and of 15 multiple-unit three-coach electric sets. In addition Spanish factories produced a number of electric sets for addition to 1,500-volt rolling stock. Talgo train developments were the subject of study and 1,829 freight wagons were put in stock. Some 70 miles of single line were equipped with C.T.C.; radio communication is available from six RENFE centres.

#### Improved Productivity

PROGRESS in Spain is coming into line with the remarkable development of European railway traffic generally in the past two decades—progress all the more notable because of the rise of powerful road transport and air competition. Compared with 1938, traffic on the railways of Western Europe has increased by over one-third and now stands at 134 per cent of the 1938 figure. The amount of traffic hauled or carried by diesel or electric traction was about 20 per cent in 1938 and has now risen to more than one-half of the present traffic or 64 per cent of that carried twenty years ago. Modernisation has been accompanied by a fall of nearly 40 per cent in the total number of locomotives and, of course, by gains in speed, comfort and economy. For 16 European administrations, totalling about 108,000 miles of line, or 88 per cent of the railways in Western Europe, passengers carried in 1938 totalled 4,551,616,000 and, in 1957, 4,966,182,000. The passenger-kilometres rose by 60 per cent; in the same period the ton-kilometre figure grew by 56 per cent. This was done with roundly the same staff and in some countries by fewer men, so that productivity per employee has risen by 49 per cent. Mechanised marshalling yards, centralised signalboxes and greater use of power equipment in permanent way renewal, goods

station working and booking offices are contributory factors to the result. The hours of labour for renewing a given length of track on one railway have been reduced by 33 per cent, for example. In another case daily productivity in goods depots, through use of fork-lift trucks and pallets, is up by 21 per cent. The remaining steam locomotives of two large systems are reduced in number by 55 per cent as compared with the immediately prewar period, but the annual mileage covered by each engine has gone up by 70 per cent. The loading capacity of the average wagon has risen by 25 per cent so that a wagon stock 19 per cent smaller than prewar, more intensively employed (turnround has been reduced by reduction of the time between two successive loadings on one railway from 8.1 days to 4.1), can deal with the increased traffics already mentioned. Delays through hot boxes, as well as the power expended on haulage, have been reduced by the vastly increased number of wagons running on roller bearings.

#### Work of I.R.C.A.

A MIDST the welter of effort on modernisation the task of the International Railway Congress Association, with its meeting every four years in addition to its day-to-day work for the railways of the world, is a most valuable one. It provides an opportunity for review of what has been accomplished, what are the best accepted practices, and directions for further research and investigation, in every aspect of the railway business. The 17th Congress, to be held in Madrid from September 28 to October 7 this year, will discuss reports on the problems associated with the ageing bridges and viaducts, effects of fatigue and corrosion on steel and weathering on masonry and methods for maintenance, repair and strengthening of structures. Also in the way and works section are reports on the handling and economies of long welded rails. Under locomotives and rolling stock the design and improvement of railcars and multiple-unit diesel trains is being reviewed, as well as the maintenance and repair of electric locomotives (in which one of the reporters is Mr. K. J. Cook, chief mechanical and electrical engineer, Eastern and North Eastern Regions). In working, goods depot methods for small merchandise consignments and the problems of general palletisation are being considered, while Mr. G. F. Fiennes, line traffic manager, Great Northern, Eastern Region, is one of the reporters concerned in dealing with research into principles of operating diesel and electric passenger services. The general section will deal with reports on electronic computation of pay slips, traffic and stores accounts, checks on rolling stock distribution, and rapid compilation of statistics.

#### Financing the Railways

PARTICULAR importance, in view of widespread modernisation plans, attaches to the second question in the general section, under which the conservation of railway capital and methods of keeping equipment up to date are discussed. Arrears in wartime damage repair and rolling stock renewal are found on railways which do not exist in industry; the railways do not have the funds themselves to finance renewals. Most railways are unable to cover the cost of amortisation calculated on the economic (and not the technical) life and on the replacement value of the asset. Often pressure is brought by Governments to keep renewal charges low so as to reduce deficits to be met by the State. "What the State gives to railways so far as it meets the deficits is as a rule too much for dying and too little for living," says Mr. W. Keller (of the Swiss Federal Railways) with a flash of genius in his special summary. The delay in renewal and modernisation of the investments weakens the position of the railways versus their competitors; for example, railway carriages 40 to 50 years old cannot compete with modern cars or aeroplanes. Old equipment is also an obstacle to greater productivity. The result is a growing deficit which then causes greater pressure on the allocations for replacements and renewals. Self-financing by "earned" amortisations, covered by the receipts, is the only way to break the vicious circle and for that the railway must be indemnified for costs incurred to meet State policies of national economy and be relieved of charges outside operating needs; co-ordination is also needed to put the railway on an equal footing with other carriers, it is stated. The reports on the tenth question deal with means of revivifying the economy of light and secondary railways and saving them from extinction. There is considerable food for thought in the fare provided at Madrid.

[Forthcoming Events appear on page 11]

MODERN TRANSPORT has an arrangement with Reuter's Trade Service whereby publication is made in this newspaper of all essential news from all parts of the world concerning traffic and transport by rail, road, sea and air and allied interests.



# SPANISH NATIONAL RAILWAYS

## Reconstruction and Modernisation

By JOSE PUIG BATET, General Manager of RENFE

AS a result of the civil war, the Spanish National Railways was left in such condition as to make its overhaul and reconstruction a matter of immediate necessity. To this end the Spanish Government, in 1946, approved and sanctioned a five-year plan for the expenditure of 1,500 million pesetas, a sum which proved so inadequate to cover the cost of the most urgent essential works that in 1949 it was increased to 5,000 million pesetas, a sum to cover the expenditure over a period of six years.

Owing to the increased cost of labour and materials, and the fluctuation in the rates of foreign exchange, even this estimate proved insufficient, and it was increased in 1952 by a further 12,700 million pesetas. On these sums being expended, in 1955 a further estimate covering the expenditure of up to a total of 24,500 million pesetas came into being, and up to the beginning of 1958 some 15,000 million pesetas of this total had been expended.

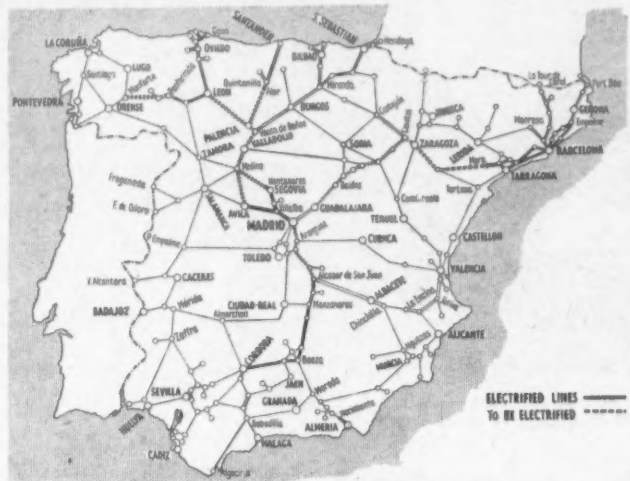
### Achievements

Amongst the most important works carried out in recent years mention can be made of:

Electrification of various lines with a total length of 1,085 km., of which 222 km. were double track.

Increase in the number of locomotives by 120.

Electrification proposals for Spanish Railways



which has been selected the more urgent works to be carried out in five years at a cost of 24,700 million pesetas. These plans are now awaiting Government approval. In the five-year plan marked preference is given to improving the permanent way and to electrification, to be followed by improvement of the capacity and efficiency of the locomotives and rolling stock.

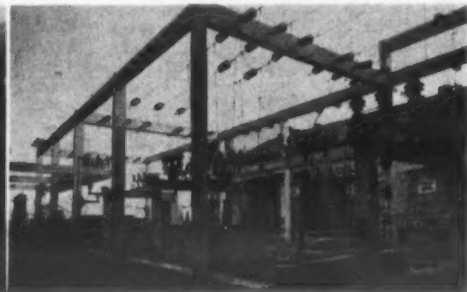
It is proposed to attend to permanent way renewal with far greater rapidity than was laid down in previous plans of reconstruction, without lessening or sacrificing the work of maintenance and consolidation of the existing way. The renewal programme involves a total of 2,403 km. of track at an estimated cost of 5,328,460,000 pesetas, to be carried out at a speed which will amount to double that being achieved at present. To attend to the maintenance of other lines, for the renewal of which the time has not yet arrived, it is proposed to acquire a large quantity of sleepers.

### Re-laying Programme

In this plan the lines between Madrid and Hendaye and Madrid and Barcelona will be completely relaid. On the Madrid—Palencia—La Coruña branch the stretch between Palencia and Monforte will also be relaid. In the re-laying plans the lines constituting RENFE have been put in two categories, according to their importance and the service rendered; the lines in category I will be relaid with rail of 54 kg. per metre, joint supported,



C.T.C. control panel at Cordoba on the Madrid to Sevilla main line; right, La Granja sub-station on the León—Ponferrada line of the Spanish National Railways



Re-laying of 2,000 km. of track, and the renewal or strengthening of 150 bridges.

Installation of centralised traffic control or C.T.C. on various lines to a total length of 160 km.

Stepping-up the production of reinforced concrete sleepers to a total of 220,000 annually.

Laying in some sections of welded rail, on reinforced concrete sleepers, in lengths of 1,000 metres, over which track it has been possible to achieve speeds in excess of 75 m.p.h.

No less than 4,000 km. of telecommunication lines have been reconstructed with an entirely new selective telephone circuit and other work has included:

Installation of colour-light signals in 460 stations, and electric lighting for 1,150 discs (distant signals).

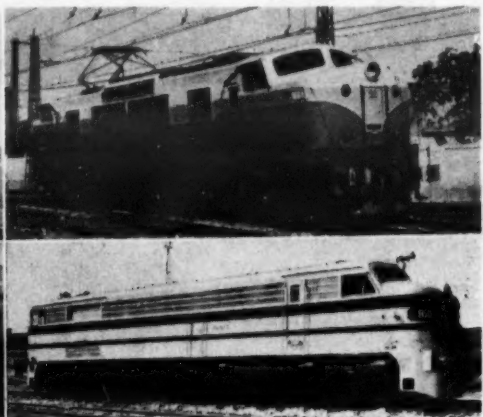
and with reinforced concrete sleepers, whilst the lines falling in category II will be relaid with rails of 45 kg. per metre, joint semi-supported, and with wooden sleepers.

Amongst the improvements to the permanent way defence works against snow, sea, flood and subsidence have been provided for; improvement in tunnels, overbridges, underbridges and level crossings, and the rebuilding or permanent strengthening of a great number of bridges, is also proposed.

The improvement and expansion of track and buildings has been provided for at some important stations, and platform extension at a number of stations on principal lines to take trains of con-



Oil-fired 4-8-4 RENFE steam locomotive built by M.T.M., Barcelona; 3,600-h.p. 3,000-volt electric locomotive at Barcelona; below, T.A.F. diesel railcar set; and, right, Alco 1,800-h.p. diesel-electric locomotive



Addition of 476 steam locomotives, 40 diesel shunting engines, 500 passenger coaches, 10,000 goods wagons, 20 TAF trains, and two TALGO trains.

Oil fuel installation on 355 steam locomotives.

Automatic braking, strengthening of drawgear, and replacement of axles in more than 20,000 wagons.

Provision of water purification equipment for steam locomotives.

Carrying out of important building works for workshops, locomotive depots and station extensions.

### New Modernisation Plan

The economic aid to RENFE as a result of the agreement of September, 1953, between the Governments of Spain and the United States of America, has represented, in the first four years a total of 28,125,707 dollars in goods, and in freights 637,216 dollars, expended principally, up to now, on the Madrid—Cadiz line.

RENFE has submitted a new plan of modernisation involving a sum of 72,000 million pesetas, from

siderably increased length. Continuing the policy initiated by RENFE, there has been included in this five-year plan provision for the establishment of central stations for the concentration of goods traffic.

### Motive Power and Rolling Stock

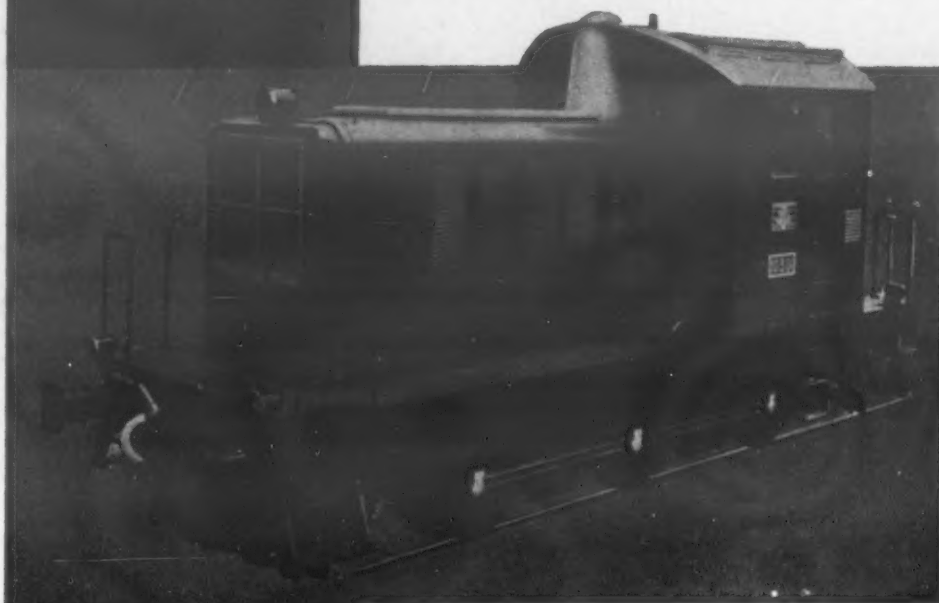
The objective pursued so far as refers to motive power has been mainly to convert to diesel power the passenger service units where electrification has not been contemplated; to dieselise all motive power in the Galicia area, thus completing the improvements achieved to date; the replacement of old and very heavy steam engines used in shunting operations by diesel-powered units is also planned. Thus an adequate force will be available to cope with all shunting operations in both the electrified section as well as that earmarked for dieselisation, serving economically all stations according to their importance.

As regards rolling stock first place is given to the modernisation of goods vehicles, the acquisition of

(Continued on page 25)

100 Sulzer  
engined  
locomotives  
are in  
service  
or on order

## SULZER Diesel Engines for Railway Traction



A 350 h.p. Diesel Electric Shunting Locomotive of R.N.F.E.

for the  
Spanish  
National  
Railways  
(R.E.N.F.E.)

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Sulzer engines are manufactured by  
La Maquinista Terrestre Y Marítima  
S.A., Barcelona and Sociedad  
Española De Construcciones Babcock &  
Wilcox Compania Anonima, Bilbao.

## Which battery is built like the King George V?



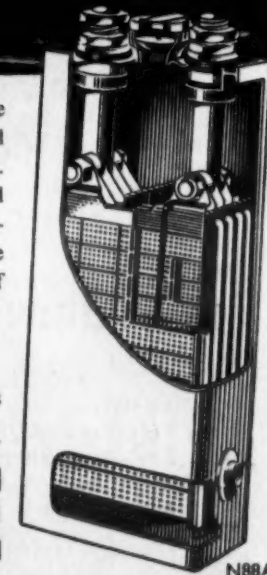
**Its name is Nife!** This exceptionally tough battery is also made of steel and like the King George V is built to last—to withstand shock and vibration and to stand up to severe mechanical conditions. Unlike this giant locomotive, however, a Nife battery is small and compact, takes up very little room and requires virtually no maintenance. Also a Nife battery withstands the heaviest discharge, is free from self-discharge and is unaffected by idleness in any state of charge. It repays its original cost many times over!

No wonder so many railway engineers rely on Nife Batteries for:

TRAIN LIGHTING • AUTOMATIC TRAIN CONTROL  
EMERGENCY TRAIN LIGHTING • SEARCHLIGHTS & INSPECTION SETS  
DIESEL ENGINE STARTING • BATTERY ELECTRIC TRUCKS  
SWITCHGEAR OPERATION • ALL FORMS OF TRACK & SIGNAL CONTROL

# Its name is NIFE

THE STEEL ALKALINE BATTERY



N88A

Nife Batteries • Redditch • Worcestershire



## LORRY—BUS—COACH

## Bristol Bus Changes

APPEARING for the Bristol Omnibus Co., Limited, before the Western area Traffic Commissioners on Monday last week, Mr. T. D. Corpe made 55 applications for changes affecting Bristol city and country bus services to come into operation with the opening of the new country bus station in Whiston Street later this month. The proposal is for a vastly improved network of city services introducing a new city route pattern of some magnitude. It will link extreme suburbs and cut out the centre termini by providing through services.

Mr. W. V. Williams, the company's divisional traffic superintendent, said it was doing its best to meet every reasonable request for improved services made during the past years. The application would reduce fares. The River Avon was a bar to an outer ring service, but the proposed scheme would connect east and west suburbs as far as possible. Present changes were made possible by completion of the inner ring and the country bus station. Mr. Corpe said country bus services which now had termini at The Centre, Old Market Street and Prince Street would operate from the new station. The company was most anxious to put revised country services into operation on September 21. Express carriage service proposals were designed to take effect a few weeks later. The applications were granted, subject to certain route approvals.

## Ticket Check

FROM August 31 until September 15 Bury and Salford transport conductors are issuing two tickets to through passengers on the joint Whitefield—Walmersley route, so that they can determine the exact apportionment of receipts between the two authorities.

## Rail Hopes in South Africa

ROAD hauliers should not invest too heavily in new vehicles and other equipment, said a member of the South African House of Assembly. By 1960 or 1961 it was expected that the South African Railways would be able to resume the carriage of much of the traffic that in recent years had been left to road hauliers. This change referred particularly to the coal carried from the Witbank area to the Rand. It seemed likely that within a few years all this coal would again be carried by rail.

## The New ARTCO

ARTCO is holding an open meeting on September 30, at 2.30 p.m. at the White Hall Hotel, Bloomsbury Square, W.C.1, to formulate its future policy. It has now been reconstituted on association lines and is a company limited by guarantee. It is anticipated that the members of the old company (Transport Associates, Limited, in voluntary liquidation) will join the new ARTCO and they are being invited to the meeting. In addition, any haulage contractor who is interested in this idea of voluntary co-ordination of long-distance haulage is invited to attend. Owners or directors of transport companies in London for the Commercial

Motor Show (or their traffic managers) are invited. Mr. H. L. Walker will take the chair. A luncheon is being held before the meeting. The secretary of Associated Road Transport Contractors, Limited, is Mr. H. N. Inch, at 177 Sloane Street, S.W.1.

## Manx Bus-Air Terminal

DELAY in the scheme to build a £50,000 air-bus terminal in Douglas, Isle of Man, has been criticised at a Douglas Town Council meeting. Councillor R. C. Steven, Deputy Mayor, and chairman of the Finance Committee, said the two



One of the new Dodge forward-control trucks leaving an opencast site in the East Midlands; right, the Thames Trader as an articulated tanker, with Scammell coupling, at work in the Manchester area

the region of 3 million passengers. Traffic revenue increased by £77,544 from £1,863,422 to £1,940,966. The undertaking had budgeted for a surplus of £40,000 on the level of expenditure at the beginning of the year. Working expenses were increased by £75,466 to £1,791,273.

## Assaulted Conductor's Compensation

AN amendment to the Industrial Injuries Act following the case of a Salford bus conductor who was refused benefit under the Act after being injured when he was assaulted by two youths on his bus, is to be sought by Mr. Frank Allaun, M.P. for Salford East. The conductor, Mr. Clifford Richardson, aged 48, of Bradley Avenue, Salford, was unable to work for 12 months and can now do only light work at the bus depot. Mr. Allaun said that he intended to ask the Attorney-General if his attention had been brought to the court's decision that Mr. Richardson was not entitled to



a penalty clause that if an employee had refused to work overtime during any of the preceding five days his Saturday rate must be at time-and-a-third for a corresponding period.

## T.U.C. and Shorter Haulage Day

LAST week a resolution tabled at the Trades Union Congress by the Scottish Horse and Motormen's Association and calling upon the Minister of Transport to introduce legislation to amend section 19 of the Road Traffic Act, 1930, so as to reduce the maximum permitted period of driving within any 24 hours from 11 to 10 hours, and to increase the minimum rest period between turns of duty from 10 to 13 hours, was referred to the general council of the T.U.C. The resolution also expressed the fear that, on our present inadequate roads, the increased tempo of driving heavy goods vehicles at 30 m.p.h. would have an adverse effect on the health of drivers and would greatly shorten their working life.

## Austrian Railway Road Services

RAILWAY-OPERATED bus services in Austria now total over 5,000 route-miles. This includes mileage run on behalf of the Europabus network. Road vehicles owned by the Austrian Federal Railways comprise 472 buses, 26 passenger trailers and 11 luggage trailers. For freight haulage there are 73 railway-owned oil-engined lorries and 42 trailers, according to recently published figures. A number of container-carrying vehicles is employed at certain railheads in addition to 16 railway wagon transporters for the provision of door-to-door services. Furthermore the railways also hire between 50 and 60 p.s.v.s from private operators. In 1957 a total of 45,673,000 passengers was carried on the 148 routes operated by Austrian Federal Railways buses.

## One-Man Buses in East Kent

THE East Kent Road Car Co., Limited, is converting another 16 of its services to one-man operated buses as an alternative to complete withdrawal. The company has 26 one-man services already, and the additional services will be introduced with the revised winter timetables on September 14. The 41-seat front-entrance semi-coach will be the standard vehicle used. The services affected are: 5, Canterbury and Whitstable; 7, Canterbury and Herne Bay; 9, Ramsgate and Sarre; 14, Canterbury and Staple via Goodnestone, combining Canterbury and Staple, and Canterbury and Goodnestone services; 19, Canterbury and Six Mile Cottages; 37 and 38, Herne Bay and Faversham; 58, Margate and Wingham; 65, Ramsgate and Sarre and Upstreet; 70, Ramsgate Harbour and Minnis Bay; 100, Cheriton Library and Wear Bay Road, Folkestone; 102, Folkestone and Swinfield; 107, Brabourne Gardens and East Cliff Pavilion, Folkestone; 115, Rye and Rye Harbour; 117, Rye and Cadborough Cliff; and 122, South Willesborough and Cobbs Wood Estate, Ashford. In summer, Nos. 37 and 38 will revert to two-man operation, with larger vehicles.

## Bus and Coach Developments

Application by Manchester Corporation to operate an express service between London Road and Oxford Road stations to replace the M.S.J. and A. electric trains during the electrification work on the main-line 25,000-volt equipment at London Road, gives the period of operation as from mid-September, 1958, to the spring of 1960.

transport undertakings, Isle of Man Road Services, Limited, and Douglas Corporation, had reached agreement with the Airports Board on the proposal, and detailed plans had been prepared with the best possible advice. Subsequently the matter went before the Executive Council of the Manx Government, and it decided that a further expert must be brought in. There was now little hope of an air terminal next summer.

## Nottingham and its Lost Passengers

DURING the past year, 8 million fewer passengers travelled on Nottingham's buses, and the city transport department had a loss on the year's working of slightly over £20,000. Alderman S. P. Hill, chairman of the Transport Committee, referring to lost passenger traffic, said that it was difficult to assess the extent of the recession owing to the restricted use of cars between December, 1956, and April, 1957, which increased the usage of public transport in 1956-57, the effects of the influenza epidemic in 1957 and the bad weather during the summer months which reduced traffic during 1957-58. After allowing for those influences it was still apparent that there was a considerable loss of traffic from other causes. This was probably in

benefit on the grounds that his injuries did not arise out of his employment. He will ask for amending legislation "to remedy this injustice and give employees redress in the future."

## Bodybuilding Wage Claim

AFTER having heard an application for a "substantial increase" in motor vehicle building workers' wages, at a London meeting on August 20, the employers' representatives promised to let the trade unions have their reply not later than the end of September. It was put forward by the National Union of Vehicle Builders, the Amalgamated Society of Woodcutting Machinists and the Electrical Trades Union, meeting the employers' United Kingdom Joint Wages Board, representing the National Employers' Association of Vehicle Builders, the National Federation of Vehicle Trades and the Scottish Association of Vehicle Builders. At the same meeting, agreement was reached concerning overtime pay. From Monday to Friday it will be as hitherto, at the daily rate of time-and-a-third for the first two hours and time-and-a-half thereafter. All Saturday work will be paid for as overtime at time-and-a-half unconditionally, the employers having agreed to abolish

The  
**QUALITY**  
- built  
**14 TON**  
G.V.W

**THORNYCROFT**  
**MASTIFF**

## FEATURING

## ENGINE

THORNYCROFT designed and manufactured 6-cylinder direct injection oil engine. 109 b.p.h. (net) at 1,800 r.p.m. 354 lb. ft. torque at 1,000 r.p.m.

Nitrided crankshaft with copper lead bearings.

## GEARBOX

5-speed gearbox with optional overdrive.

## BRAKES

Air pressure servo hydraulic brakes.

## FRAME

10½" deep flat topped frame (with six sturdy crossmembers) allowing a light body underframe to be used.

## WHEELS &amp; TYRES

10-stud wheels with 10.00-20" 14 ply tyres, twins rear including spare wheel and tyre.

## STEERING

Power assisted steering (optional extra).

## BODY LENGTH

21' 6"



## FODEN 1958

### New K-Type Eight-Wheeler and Tractor (Cont.)\*

#### INCREASED TWO-STROKE DIESEL POWER

**I**N the new Mark III two-stroke diesel engines a pressurised radiator is used to minimise loss of coolant and to prevent boiling on high-altitude mountain passes and a larger water pump impeller provides better coolant circulation. A lower-viscosity lubricating oil (S.A.E. 20 instead of S.A.E. 30) is used to give better starting and lower fuel consumption and the opportunity has been taken to improve the oil quality to Supplement I level, as the recent price reduction by the oil companies renders the use of this improved-quality oil a sound economic proposition.

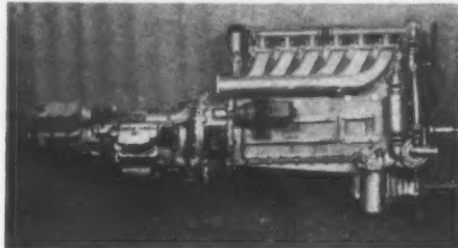
##### Modified Fuel-Injection Pump

The fuel-injection pump has been modified to include a stiffer camshaft, larger bearings and cam-

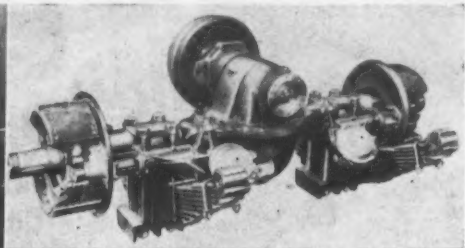
heavy-duty applications. When the Gardner LX engine is used for light high-speed duty up to about 35 tons gross combined weight, the existing 12-speed overdrive gearbox can be used in the United Kingdom and other countries approved by the technical department.

##### Integral Power Steering

There is wide diversity in the front axle coverage, with capacities from 4 to 15 tons, and rear axle coverage from 9 tons in a single axle to 30 tons in four-wheel bogies, to suit about every type and condition of road and off-road operation. The column of the Foden recirculatory-ball steering gear has been the subject of redesign to permit the integration with the standard system of hydraulic



The Foden Mk. III FD6 two-stroke diesel and new FR71 gearbox probably provide the lightest and most compact 150-b.h.p. 12-speed combination in the world; right, the new extra-heavy-duty 12-ton capacity axle with forged casing



box lubrication by oil circulated from the engine, instead of using fuel for lubrication as before, and the fuel pump elements have been modified to improve performance. The fuel filters are now mounted on the engine on the pressure side of the fuel feed pump to eliminate air locking. These arrangements also increase the life of the filter elements. An improved flywheel oil seal on the crankshaft eliminates risk of leakage at this point and positively prevents the ingress of dust under the most severe conditions. The improved per-

formance of the engine is assisted by modifications to the camshaft and cylinder liners to improve scavenging at high speed. On the subject of interchangeability, all marks of engine are interchangeable as complete units. As regards components, although Mark II engines cannot be converted to Mark III, the majority of Mark III parts will service Mark II engines, and details will be available shortly. With the proprietary engines now offered, which include Gardner, Rolls-Royce and Cummins units, Foden diesel power now covers a range from 75 to 300 b.h.p. While Rolls-Royce engines are offered as standard alternatives for some vehicles in the



A four-wheel 7-cu. yd. dumper of the earlier type which is now available with 8-cu. yd. capacity

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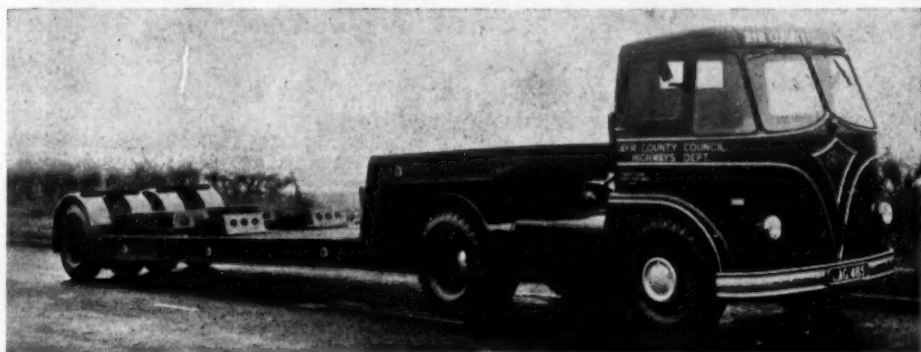
##### Higher-Capacity Dumpers

Making full use of the wider-ranging components, Foden standard four- and six-wheeled dumpers with certain modifications of the earlier specification are now cleared for higher capacities and gross weight. The four-wheeled payload capacity has been increased to 8 cu. yd. struck measure or 23,500 lb. and the body has been adjusted to give correct distribution of the 40,300 lb. gross weight. For flat quarry work the 100-b.h.p. Mark III Foden FD4 or the 94-b.h.p. Gardner 5LW engine is used while the 150-b.h.p. FD6 is fitted for rough earth-moving work, in conjunction with an eight-speed underdrive gearbox. Various tyre and wheel arrangements and either single- or double-reduction rear axles are available to suit particular types of operation. As the outside body width does not exceed 8 ft., with single rear tyres the vehicle can be used on the road but with twin rear tyres overall width exceeds 8 ft.

The six-wheeled dumper now has a payload capacity of 11 cu. yd. struck measure or 40,000 lb. inside a maximum gross weight of 67,300 lb. Power units available are the Foden FD6 Mk. III (150 b.h.p. at 2,400 r.p.m.), the Rolls-Royce C6 (210 b.h.p. at 2,100 r.p.m.) or the Cummins HF6B (180 b.h.p. at 2,100 r.p.m.) and the standard gearbox is the new FR71 twelve-speed unit. Again, there is a wide selection of tyre and wheel arrangements and single- or double-reduction rear axles and on both types of dumper the new Foden integral hydraulic steering servo is available as an optional extra.

##### FR6 Range

The FR6 Foden range, which was developed earlier this year, is an extension of the FG range incorporating modifications permitting the use of the Rolls-Royce 200-b.h.p. diesel engine. These chassis can be made as six- and eight-wheel tractors and load carriers and generally are not intended to carry more load but to travel at higher speed with less gearchanging than the FG types. Origin-



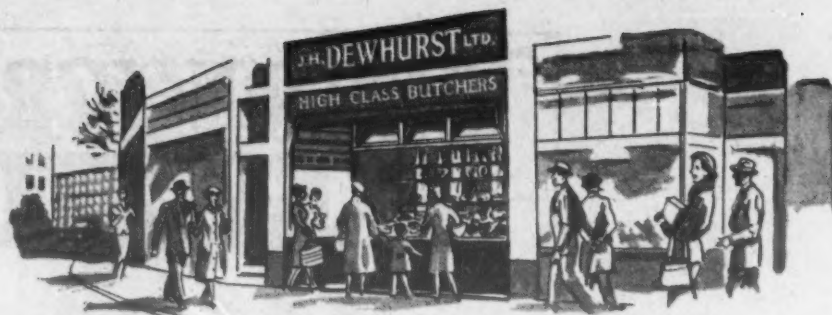
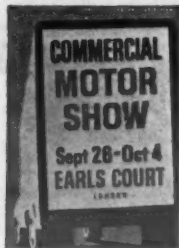
A Foden FG6/25 tractor used by Ayr C.C. with this Dyson low-loader to carry roadmaking plant and with a second 10-ton tipping semi-trailer for transporting road materials

range and are standard in the FR6/40 and 6/80 tractors and FR6/45 dumper, Cummins engines are not held in stock and are fitted to special order only. The gearbox range includes four-, five-, eight- and 12-speed units with input torque capacities of 400 to 550 lb./ft. and a three-speed unit of up to 900 lb./ft. capacity designed for use with the Rolls-Royce hydrodynamic torque converter in the FR6/45 28-ton dumper.

##### New Gearbox

The new FR71 12-speed gearbox for 550 lb./ft. torque is an extension of the Foden range using a four-speed constant-mesh unit in series with a preselective compound epicyclic train. Unlike the existing 12-speed unit, there is no overdrive range but two steps down from direct drive through the auxiliary train to 1.58 and 4.16 to 1, providing overall gearbox ratios progressing in mainly evenly spaced steps from 15.2 to 1 to 1. The FR71 has been designed primarily for use with the Rolls-Royce 200-b.h.p. engine, and also the new Gardner LX6 150-b.h.p. unit when used in tractor and other

\* The first part appeared last week



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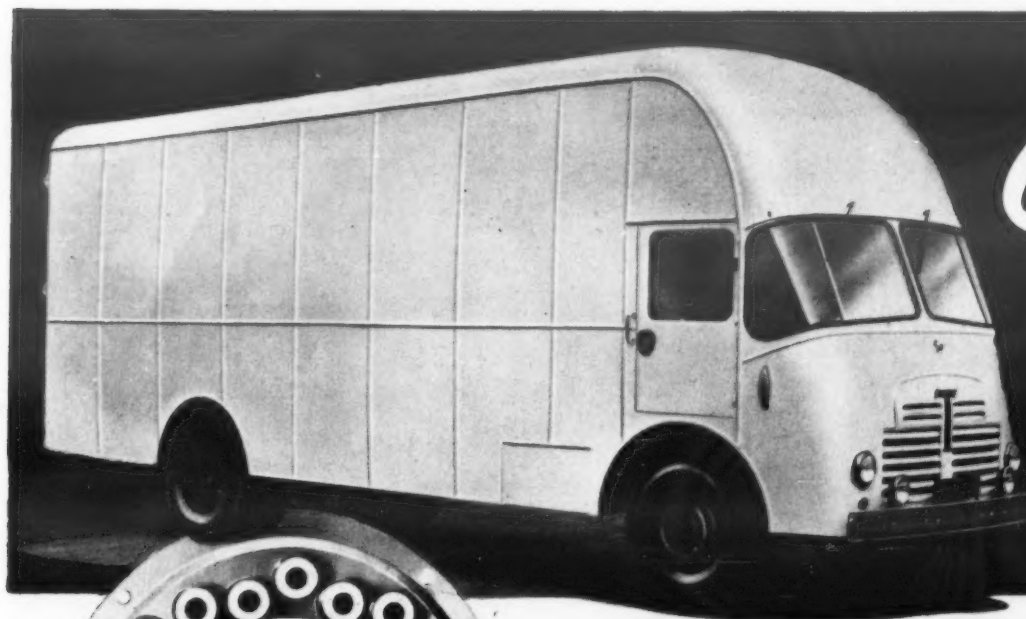


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**Front Axle Assembly  
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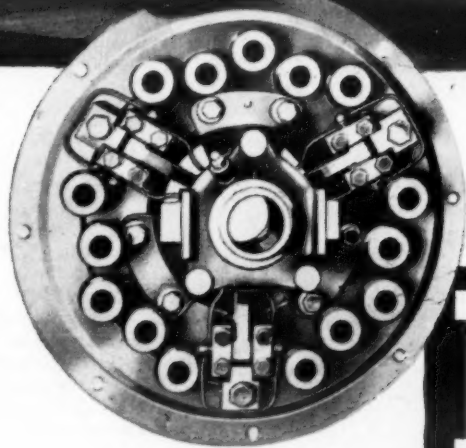
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THE NEW  
**THORNYCROFT  
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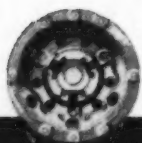
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is fitted with a **14** inch

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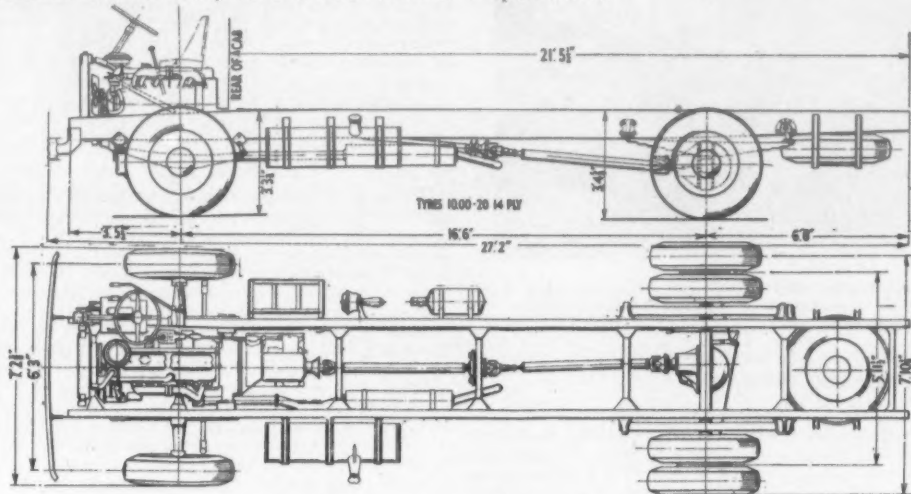
## COMMERCIAL VEHICLE TEST

## Thornycroft Mastiff Maximum-Weight Four-Wheeler\*

### A REMARKABLE PERFORMER WITH QUIET MANNERS

**A**MONG the range of vehicles on the Thornycroft stand at the forthcoming Commercial Motor Show will be the company's new two-axle goods vehicle designed for operation at the maximum gross weight of 14 tons for this class in the United Kingdom. Named Mastiff and given the type designation ML NS6, the newcomer is a worthy stable companion to the recently introduced Trusty eight-wheeler (which will also be exhibited at Earls Court) and in a recent MODERN

quarter lights ahead of the door pillars and three windows in the back of the cab, the centre one of which has an opening section. The instruments are adequate and easy to read and controls are all conveniently placed, while the commendable Thornycroft practice of providing a fully adjustable driver's seat and adjustable-height spring-spoked steering wheel makes the selection of an exactly correct driving position possible for any size or shape of driver.



TRANSPORT road test its standard of equipment, performance and handling characteristics proved as outstandingly good as those of the Trusty itself.

The Mastiff is based on a main frame of 10½ in. by 3 in. pressed-channel sidemembers and substantial crossmembers assembled by fitted bolts, suspended on four progressive semi-elliptic leaf springs ¾ in. wide, the front with 46 in. and the rear with 60-in. centres. Tyres are 10.00-20 14-ply on B 7.0 rims and overall width over twin rear is 7 ft. 10½ in. Alternative wheelbase lengths available are 16 ft. 6 in., accommodating a 21 ft. 6 in. by 8 ft. body, and 12 ft. 6 in. for a 15 ft. 6 in. long body. A continuous-flow hydraulic servo is available as an optional extra for the cam-and-double-

The handbrake lever is on the right-hand side of the driver and has a good arc of travel without obtruding into the doorway. This, together with a specially designed lever and rod system, has provided an efficient brake without recourse to the use of the slower-acting multiple-pull handbrake with cables liable to stretch usually required with vehicles of this weight. During our test Tapley meter readings of 35 per cent were consistently recorded from speeds around 20 m.p.h. without the lever coming into that awkward position where a moist or greasy hand is liable to slip over the top and the muscular power of the arm is at its weakest, evidence of a good deal of painstaking design work.

Very few minutes behind the wheel convinced us

## TEST RESULTS AT A GLANCE

### Vehicle Details

**MAKER:** Transport Equipment (Thornycroft), Limited, Basingstoke, Hants.

TYPE: ML NS6 Mastiff maximum-weight four-wheeler.

**ENGINE.** Thornycroft NS6 six-cylinder direct-injection diesel, bore 4½ in. (104.8 mm.), stroke 6 in. (152.4 mm.), capacity 480 cu. in. (7.88 litres); 115½ b.h.p. (max.) at 1,800 r.p.m., 354 lb./ft. torque at 1,000 r.p.m.

**TRANSMISSION:** 1. Clutch, Borg and Beck single dryplate, 14 in. (350 mm.) dia., 182.5 sq. in. (1,177.4 sq. cm.) total lining area; 2. gearbox, Thermodyne 100 mounted six-speed over-drive top constant-mesh, ratios 7.05, 3.9, 2.38, 1.49, 1.0 and 0.81 to forward, 6.3 to 1 reverse; 3. driveshaft, two open tubular shafts with Hardy Spicer needle roller bearing universal and double-trunnion-mounted intermediate bearing; 4. rear axle, Moss 10-ton capacity with spiral-bevel gear and fully floating half shafts, ratio 5.375 to 1 (alternative 6.14 to 1 available).

**BRAKES:** Clayton Dewandre air pressure servo with Girling hydraulic drum equipment giving 676 sq. in. (4,361 sq. cm.) total lining area.

**Tyres:** 10.00-20 14-ply, twin rear.

WHEELBASE: 16 ft. 6 in. (5 m.).

**WEIGHT:** Chassis inclining order 4 tons (4,064.2 kg.); complete with works-built plastics cab and 21 ft. 3 in. (6.5 m.) light-alloy platform body in kerb trim 4 tons 18½ cwt. (5,016.7 kg.).

roller steering gear, which has a ratio of 28.5 to 1 and, coupled to a new Alford and Alder front axle, provides turning circles of about 65 ft. for the long-wheelbase and 52 ft. for the short-wheelbase chassis. Girling hydraulic brakes with Clayton-Dewandre air-pressure servo and dimensions of 15½ in. by 4½ in. front and 15½ in. by 7 in., provide a total lining area of 676 sq. in., that is, a specific area of 48.4 sq. in. per ton of gross laden weight.

## New Diesel Engine

The power unit is the new Thornycroft NS6 six-cylinder direct-injection diesel engine, which has the same capacity as the well-known earlier NR6/MV 7.9-litre unit. With a 4½ in. bore and 6-in. stroke, giving a capacity of 480 cu. in. (7.88 litres), the NS6 develops a gross output of 115½ b.h.p. at 1,800 r.p.m. Installed brake horsepower is 109 at 1,800 r.p.m. and maximum torque is 354 lb./ft. at 1,000 r.p.m. Salient features of the engine include fully balanced seven-main-bearing nitrided crankshaft with steel-backed copper lead-lined bearings; dry-type flanged cylinder liners; the Thornycroft patented differential cooling system pressurised to 4 p.s.i. and controlled by thermostat; C.A.V. fuel-injection pump with mechanical governor and multi-hole injectors accessible without removing the valve covers; and full protection by efficient filtering of the lubricating oil, fuel and induction air. The engine is supported by three flexible mountings.

Transmission is through a Borg and Beck 14-in. diameter single dryplate clutch with ball-bearing release and unit-mounted gearbox. The standard five-speed all-constant-mesh gearbox can be provided with an overdrive sixth speed as an optional extra. The drive continues through a two-piece Hardy Spicer propeller shaft with Thornycroft double-trunnion-mounted centre bearing to a Moss 10-ton capacity spiral bevel rear axle with fully floating half shafts, providing alternative ratios of 5.375 or 6.14 to 1. Standard equipment includes a 30-gal. fuel tank, spare wheel and tyre and 24-volt electrical equipment with axial starter and 108-amp.-hr. battery while a 28-h.p. power take-off, cab fresh-air heater-demister and various other items are available as optional extras.

### Moulded Plastics Cab

The test vehicle was fitted with a moulded polyester-glass fibre cab of Thornycroft design and production and attractive interior lining panels and various small items of cab equipment were also of moulded plastics. The plastics cab, which weighs only 5½ cwt., offers an exceptional standard of comfort, with full-drop door windows, swivelling



A view into the outstandingly comfortable and attractively fitted plastics cab. The switch for the electrically fired braking-distance marker can be seen on the brake pedal

wearingly chore it could be with 5 tons borne by the front tyres. Even without assistance the steering was reasonably light, as was proved by coasting the vehicle with the engine stopped for a few hundred yards, and vehicles intended mainly for trunking service could well manage without the fitment. On shorter hauls, particularly where awkward manoeuvring or congested traffic is involved, the steering servo would be an economic proposition as an aid to speedy handling as well as making for a contented driver.

It quickly became apparent too that the Mastiff  
(Continued on page 8)



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\* No. 452 in the MODERN TRANSPORT series of road tests.



## Thornycroft Mastiff on Test

(Continued from page 7)

was no mean performer. Here we found an impeccable matching of gear ratios with engine characteristics and a range of gears that with the higher (5.375 to 1) axle ratio combined a gradient ability fully laden of 1 in 4½ with a top speed in overdrive sixth speed of 53 m.p.h. Maximum speed in direct drive was 43 m.p.h. but even apart from

specific consumption curves over the entire engine speed range.

### Fascinating to Drive

Certainly, over our hilly test route with a full load the axle ratio was not too high and long stretches could be covered comfortably in over-

The short 1-in-6 section of Bug Hill was only just too steep for second gear and the easy gearbox with dog engagement throughout permitted fast changes progressively into second and third gears as the gradient eased. Restarting in second gear was found to be possible on a gradient of 1 in 8½ and in direct drive on the level acceleration from 10 m.p.h. to 20 and 30 m.p.h. respectively took an average of 18 and 40 seconds, with smooth upward transition from the 460 or so engine r.p.m. represented by this unkindly manoeuvre. It appeared that the lower (6.14 to 1) axle ratio would be an advantage only on vehicles used mainly in exceptionally hilly districts or conditions of dense

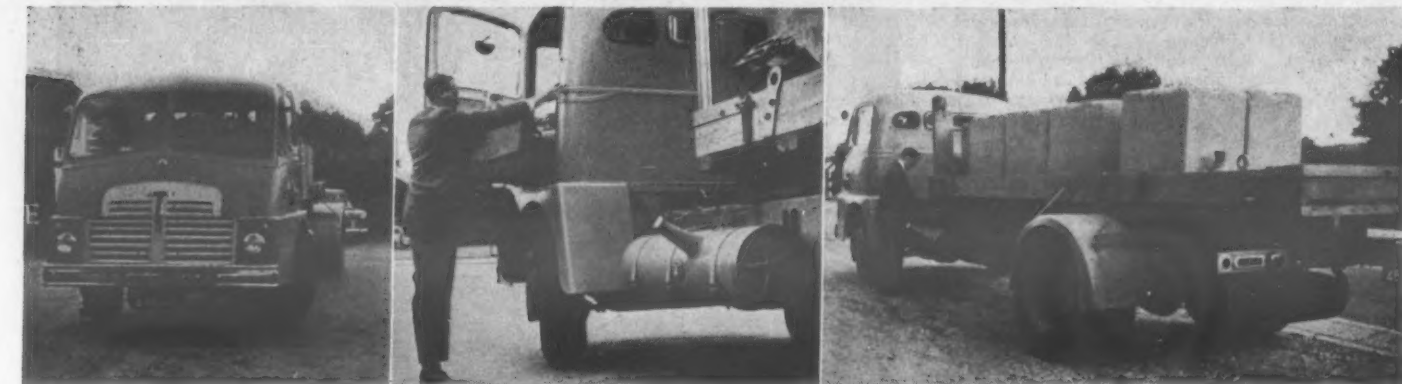
weight in our experience. This was certainly helped in this instance by the use of a quilted cover (an optional fitting) over the engine cowling in the cab but that the NS6 is an exceptionally smooth and quiet unit was also evident when we stood by outside while the vehicle was being manoeuvred.

Similarly with the general chassis performance. The vehicle was as steady as a rock yet gave a comfortable ride at high speed and low on good surfaces and poor, with lightness and precision of control that made it perhaps rather too easy to forget that it was a big vehicle with a gross weight of 14 tons. But this should not be a danger even with a grossly careless driver as the Mastiff has ample reserves of stability and braking power even at the top of its performance. Stability on corners was particularly good and moreover was achieved with the test weights set at a realistic loading height well above the chassis more nearly simulating service conditions than a shallow load evenly spread over the body floor. It is also achieved in a clean-lined design that owes nothing to helper springs or dampers. Whether the unladen ride is as good we were not able to judge but there is no reason to suppose that it would be anything but equally satisfactory. Weight distribution as loaded for the test was about right with 4 tons 14 cwt. (plus crew of two) of the total over the front axle.

### No Brake Fade

Provision of braking area on the Mastiff is more generous than on many two-axle goods vehicles and this and the use of moulded liners gave a brake that showed no evidence of fade under the harsh abuse of our ¼-mile coasting run down Titsey Hill. At the foot of the hill, where we attempt an emergency stop from about 30 m.p.h., the drums and linings on some vehicles have become heated well beyond the fade point but on the Mastiff normal efficiency appeared unimpaired. In that stop a Tapley meter reading of 64 per cent was recorded and there was a reserve of effort with the wheels at the point of locking. In normal service the Girling hydraulic-cum-Clayton Dewandre air-pressure servo and treadle valve proved an efficient easy-to-use combination that produced average overall deceleration of 18 ft. per sec. per sec. in a series of emergency stops on dry and fairly level tarmac surfaces.

Although potentially useful in a variety of roles requiring a 9-ton payload capacity, the Mastiff, in common with its contemporaries developed since the increase in maximum gross weights was approved some two years ago, is intended primarily for trunk service in this country and it was with this in mind that one of our three separate fuel



The Thornycroft plastics cab weighs about 1 cwt. less and gives better thermal and sound insulation than a steel unit; a sensibly broad stepping is the only intermediate step required comfortably to reach the low door sill; extreme right, the test load represented a genuine 9-ton payload after allowance for a 21 ft. 6 in. alloy platform body and normal equipment

the higher speed (which cannot legally be used in this country until, perhaps, the new motorways come into use) we feel there would be real advantage for most operators to opt for the overdrive, as well as for the higher axle ratio, for the saving in fuel consumption and the reduction in engine speed. While this might not be a sound recommendation with some vehicles (a higher axle ratio or too much use of overdrive can often result in a higher fuel consumption), it is valid for the Mastiff because of the small fluctuation in b.m.e.p.-torque and

drive. The NS6 produces its high maximum torque at 1,000 r.p.m. and there is only a small percentage reduction from the peak at engine speeds as low as 700 r.p.m. On the road this means that downward gear changes can be deferred or avoided and in acceleration there is immediate and satisfying response after upward gear changes. This characteristic alone made the Mastiff a fascinating vehicle to drive and in our test resulted in the very favourable average times of 12 sec. to accelerate from rest to 20 m.p.h. and 28 sec. to 30 m.p.h.

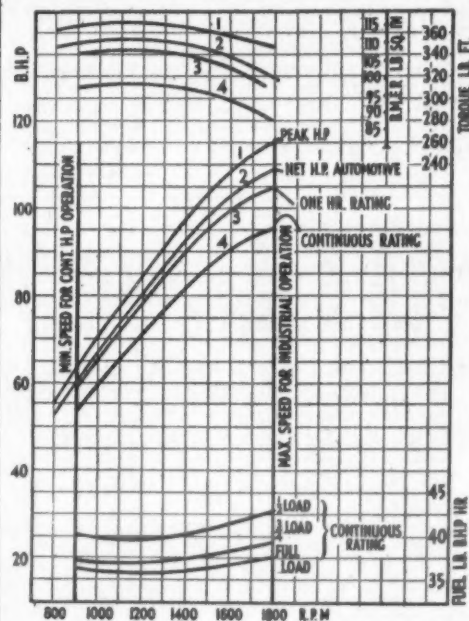
traffic where it is desirable to relieve the driver of excessive gear changing.

### Remarkably Quiet

Not the least striking feature of the Mastiff is that its whole performance is achieved with an absence of fuss and flurry and (not something we have always been able to say of Thornycroft vehicles) with a notably low level of engine noise. In fact, the vehicle tested was by far the quietest diesel-engined goods vehicle of anything like this



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Typical performance curves obtained with the new NS6 diesel on the bench

consumption checks was made. This particular test totalled 11 miles out and back over the undulating and not very wide typical Class A road between Godstone and East Grinstead. Much of the run was carried out with the overdrive engaged but gradients and other traffic in the intermediate villages necessitated some use of lower gears. In these conditions, excluding turnaround, a fuel consumption of 15.15 m.p.g. at an average speed of 33.4 m.p.h. was returned, representing the high gross ton-m.p.g. figure of 215.1 and a payload ton-m.p.g. of 137.9. This appears to be a likely return from vehicles engaged in all-loaded trunk service while some empty running could well improve the result by some 2 or 3 m.p.g.

### Adverse Conditions

Even in the more restricted conditions of our standard 15-mile consumption test run on A25 between Limpsfield Common and Riverhead, which takes in the villages of Westerham, Brasted and Sundridge in both directions, the Mastiff returned excellent figures. Traffic conditions were rather more difficult than usual necessitating frequent use of the gearbox, even down to third gear on three occasions and second gear to restart on three more, apart from reversing to turn round between the outward and inward legs. Inclusive of turning about, the figure obtained was 13.43 m.p.g. and the 15 miles was covered at an average speed of 28.1 m.p.h. Equally favourable was the fuel consumption for the whole day's work, which we think is representative of about the heaviest consumption likely from a vehicle used extensively on fully-laden short-haul work in congested and hilly conditions. In 112 miles of driving, which included about 15 miles in London suburban traffic and numerous stops and much low-gear work in the various trials, an overall fuel consumption of 11.7 m.p.g. was recorded.

To sum up our impressions of the Mastiff and such findings as are possible in a single day's driving over a fairly difficult course would involve the use of praise that might be considered fulsome. Let it suffice to say that it is a superlatively good vehicle that any manufacturer could be proud to have designed and built, that any operator could be proud to number among his fleet and that every driver who is fortunate enough to handle it will be proud to drive at his best. We think it sets a standard of heavy goods vehicle design and performance that is not likely to be surpassed for many years to come.

The executive offices of Kelvin and Hughes, Limited, have been transferred from 2 Caxton Street, London, S.W.1, to new premises at Empire Way, Wembley, Middlesex, where the telephone number is Wembley 8888.



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## PRODUCTION ATLANTEAN

Leyland Rear-Engined Double-decker\*

### LARGE CAPACITY M.C.W. BODIES

IN the normal-height version of the Leyland Atlantean with M.C.W. bodywork there is a conventional central gangway and two-abreast seating over both decks and the usual inward-facing triple seats over the rear wheel arches, with an additional similar seat over the nearside front wheel arch.

The minimum headroom given in gangways is 5 ft. 10½ in. downstairs and 5 ft. 8½ in. above. In the low-height body the floors of both decks are stepped up aft of a point just forward of the rear axle. This does not affect the seating layout of the lower deck but on the upper deck necessitates the use of four rows of four - abreast seats. Access to the first of these, which is mounted directly on the stepped floor, is from the central gangway while the other three rows, which are at normal height above the raised floor, are reached by a side gangway on the same level as the main floor and having a minimum headroom of 5 ft. 8 in.

#### All-Metal Construction

The body framework is of all-metal construction, using light steel and aluminium-alloy members, and lateral strengthening is provided by waist-high partitions at the rear of each wheel box and floor-to-ceiling partitions at the rear of the driver's compartment and the staircase. Aluminium-alloy upper-deck floor coving forms part of the struc-

at the rear and a waist-high side partition with single panel glazed with ½-in. laminated safety glass. The window on the offside of the driver is framed, with sliding glasses in top and bottom portions. The pedestal-mounted driver's seat is adjustable vertically and horizontally.

#### Windows And Ventilation

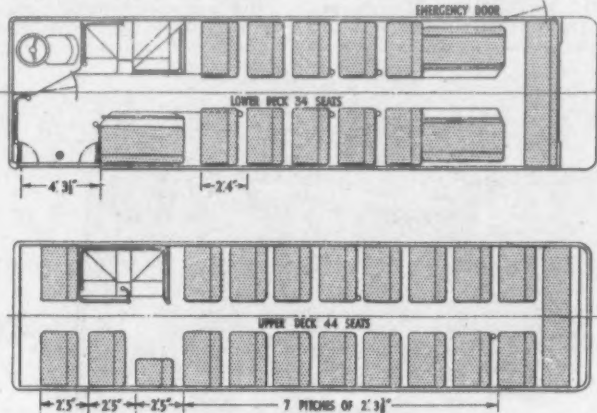
Eighteen windows, four each side of the lower saloon and five each side of the upper saloon, are

fitted with double sliding windows and perimeter glazed. All windows are glazed 26-oz. toughened sheet except the front end and front side windows of the upper saloon which are of 32-oz. toughened sheet, and the front nearside window of the lower saloon, which is of ½-in. toughened plate glass. Ventilation is provided by means of an intake in the front dome and an outlet

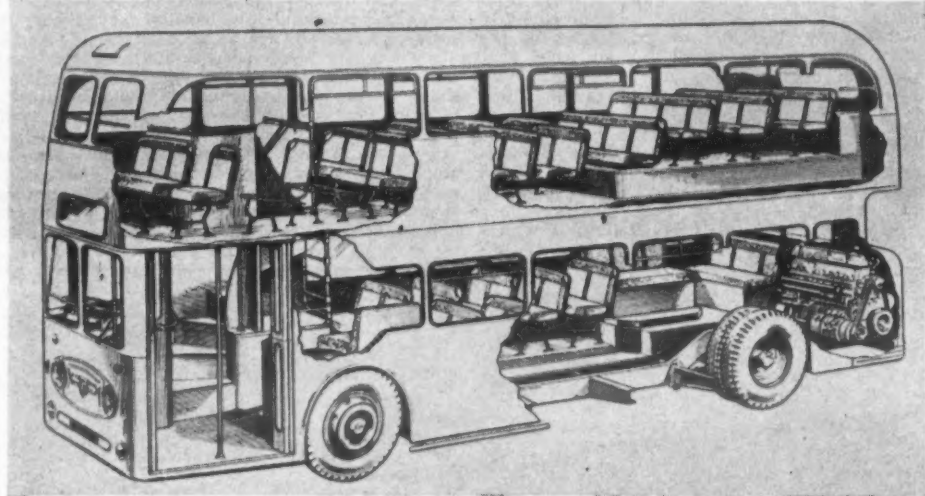
in the rear dome of the upper saloon, giving fixed ventilation. Louvre intakes are provided above the front screen and nearside window, ducted to outlets inside the lower saloon, and a louvre-type vent with interior grille in the lower saloon rear end. Emergency push buttons to release the platform doors are provided inside and outside of the body.

#### Staircase

The staircase has chequered aluminium-alloy risers and hardwood treads fitted with Ferodo



Seating arrangement for 78 passengers in the M.C.W. Atlantean normal-height body



Cutaway drawing showing arrangement for the 73-seat low-height version. A plan drawing of the upper-deck layout appeared last week

ture. Main exterior panelling, including the roof, is of aluminium Pop-ripped to the framing, except the upper saloon front, rear corner panels below the waist, exterior panels at wheelarches on both sides and front and rear roof domes, all of which are of resin-bonded Fibreglass. Specification of the equipment and interior trim can of course be varied to suit operator's requirements and the description which follows applies to a normal-height 78-seater built for Wallasey Corporation Transport Department.

The wheelarch riser panels and front-end lining in the upper saloon, are of chequered aluminium-alloy plate. Front-end lining of the lower saloon is of Lionide-covered aluminium alloy and insulation is provided between body and engine compartment. The floors are of resin-bonded plywood and Crestaline-covered aluminium alloy with Ferodo treads in gangways and on the platform. The inner ceiling panels are of Alhambra by Thomas Thomson Sons and Company. The driver's position is enclosed by a full-depth partition

\* The first part appeared September 5.

### BOOK NOTICES

#### On Road Vehicles

**THE MOTOR VEHICLE.** Sixth edition. By K. Newton, M.C., B.Sc., A.C.G.I., A.M.Inst.C.E., M.I.Mech.E., and W. Steeds, O.B.E., B.Sc., A.C.G.I., M.I.Mech.E. (London: Iliffe and Sons, Limited, Dorset House, Stamford Street, S.E.1. Price 45s., by post 46s. 6d.) First published in 1929, *The Motor Vehicle* was soon established as a standard work and an indispensable text book for students. The present edition has been thoroughly revised, with some 80 pages added, and the new matter covers recent developments in carburettors, fuel and oil pumps, opposed-piston and free-piston engines, gas turbines, supercharging and two-pedal control systems. The section on torque converters and automatic gearboxes has been expanded into a separate chapter. Information is given on many of the latest engine designs for both private and commercial vehicles. The book is illustrated with over 600 specially prepared drawings and photographs, providing a valuable supplement to the text.

**MOTOR VEHICLE EXERCISES IN CALCULATION.** By H. G. Miles, B.Sc., and L. F. W. Elen, M.Sc. (London: Cleaver-Hume Press, Limited, 31 Wright's Lane, Kensington, W.8. Price 5s. 6d.) This little book contains a comprehensive set of exercises specially designed to cover the motor vehicle technology syllabus of the City and Guilds

examination in motor vehicle mechanics. Its joint authors are respectively lecturer and senior lecturer in mathematics at Coventry Technical College and its great value to students lies in its wide coverage of the specialised examination problems, whereas in class or in the mathematics textbook the exercises set are fewer and in more general terms.

**AUTOMOBILE ELECTRICAL EQUIPMENT: Theory and Practice for Students, Designers, Automobile Electricians and Motorists.** Sixth Edition. By A. P. Young, O.B.E., M.I.E.E., M.I.Mech.E., F.I.W.M., and L. Griffiths, M.I.Mech.E., A.M.I.E.E. (London: Published for Automobile Engineer by Iliffe and Sons, Limited, Dorset House, Stamford Street, S.E.1. Price 30s. net.) First published in 1933, this book has earned a well-deserved reputation as the standard work on the electrical equipment of vehicles and other applications of the automobile engine. Written in clear and simple language, in the sixth edition the authors have taken the opportunity of drawing attention to recent developments relating to p-n junction-type rectifiers, electrical control in transmission systems (though, oddly, omitting any reference to electrical controls for fully automatic gearboxes) and impulse magnetisers. In addition, a new chapter has been introduced dealing with igniters for gas turbines.



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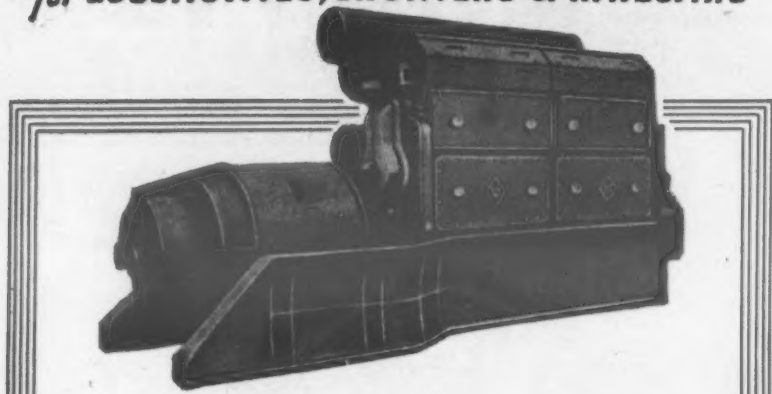
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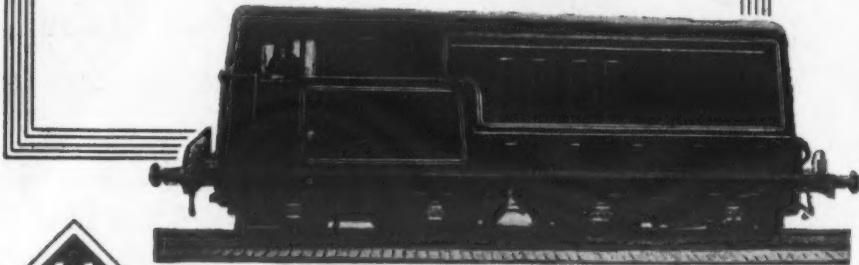
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## MOTIVE POWER FOR THE WORLD'S RAILWAYS

Role of the British Manufacturer

By G. T. OWEN, Chairman, Locomotive and Allied  
Manufacturers Association of Great Britain

**D**URING 1958 MODERN TRANSPORT has quite rightly drawn attention to the fact that two centuries have now elapsed since the railway idea was first recognised by the legislature in England; it was on June 9, 1758, that Charles Brandling secured the consent of Parliament to the construction of a railway from his colliery at Middleton to coal staiths in Hunslet, just outside Leeds. Horse-worked at first, this same railway was the scene of successful steam locomotive experiments in 1812 by Matthew Murray and Blenkinsop, and a tradition in rail motive power engineering represented today by well-known locomotive builders is still prominent in the Hunslet area of Leeds.

One British firm of locomotive builders had its origin in Newcastle 135 years ago in 1823 and was named after its first manager, Robert Stephenson, who was subsequently to achieve technical eminence in the engineering profession equalled only by his father, George Stephenson, who made the railways a commercial proposition and whose *Locomotion No. 1* in 1825 and *Rocket* in 1829 were the direct ancestors of the steam locomotive as we know it today.

### Tradition and Experience

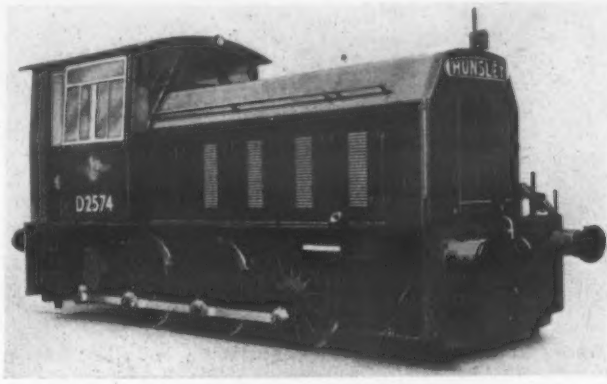
British locomotive builders combine therefore, a proud tradition with great experience, as Britain supplied the first locomotives to many countries, including U.S.A., Russia, Japan, India and Argentina, to name but a few, and subsequently supplied many thousands of locomotives to the world's railways. The wealth of experience thus acquired of the conditions in which locomotives are required to operate is invaluable to the British industry in this diesel and electric era into which we are passing. Today British diesel and electric locomotives continue to give excellent performances and trouble-free service, both of which features were, and indeed still are, the hallmark of British steam locomotives.

At this year's International Railway Congress in Madrid the extraordinary change on the world's

railways in the past two decades will be noted. Whereas in 1938, on one large group of railways totalling 75,000 route miles, 80 per cent of the train mileage was worked by steam, today 50 per cent of the mileage is worked by diesel or electric power. In the United States, where the change-over has been spectacular, the diesel percentage is even higher.

### Early Electric Traction

It is not always realised that the British manufacturer has played a considerable part in these changes. After a primary battery demonstration in Scotland in 1842 and experiments in 1883, early electric traction installations which enjoyed instant success included the deep-level underground City and South London Railway (with locomotive haulage) which opened in 1890, and, on main-line railways, the suburban schemes of the Lancashire and Yorkshire Railway around Liverpool and the North Eastern Railway on Tyneside. Both began in 1904 and both employed multiple-unit trains for the service, but the North Eastern Railway also initiated locomotive haulage at Tyne Commission Quay, Newcastle. Since then British electric traction equipment manufacturers have provided material for installations in all parts of the world.



Hunslet 204-h.p. Gardner-engined 0-6-0 diesel-shunting locomotive for the Scottish Region

### Diesel Successes

The first internal combustion designs and experiments in traction followed hard on the heels of the early electric railways at the latter end of the nineteenth century, but it was not until after 1920 that applications of the compression ignition engine became really practicable and then British builders were well to the fore, although little in this direction was then achieved on the main line railways of Britain, owing to the availability of ample cheap supplies of steam coal. One exception to this was the use of the diesel-electric shunting locomotive evolved over 20 years ago by British locomotive manufacturers in collaboration with

(Continued on page 11)

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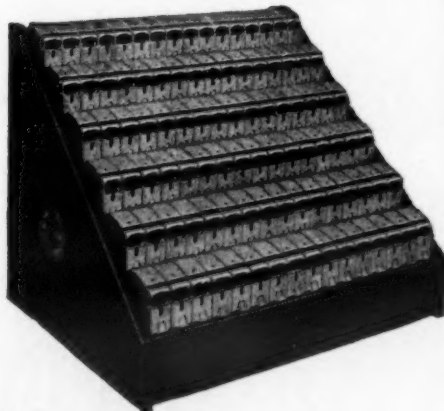
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the railways and this locomotive, which demonstrated the undoubted supremacy of the diesel for shunting work, formed the basis of the present-day British Railways standard 350-h.p. shunter which continues to be built in increasing numbers.

The British locomotive industry is probably unique in that, for many years, the railways' own workshops provided the majority of the steam locomotives required by British railways so that the industry had virtually no home market for main-line locomotives and had, therefore, to rely on its ability to sell overseas without having the stable and assured home demand which most industries regard as an essential prerequisite on which to build a successful export market.

#### B.R. Modernisation

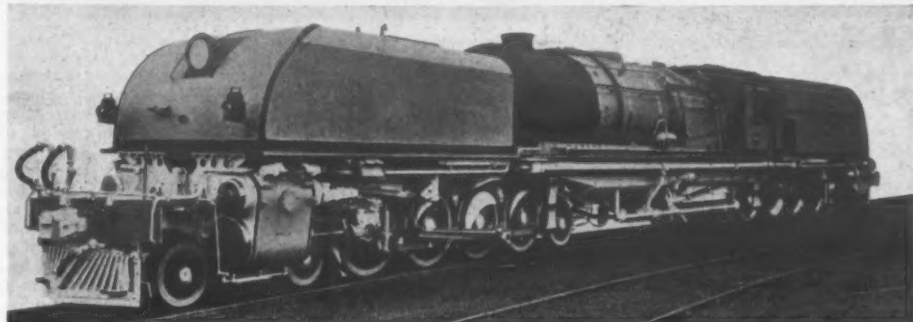
Today, however, the British Transport Commission and the British locomotive industry are working together on the 15-year modernisation plan announced in 1955 for the rehabilitation of British Railways to the highest standards. As a first step steam traction is being abolished and

20 years, and the modernisation plan provides for the elimination of 1,500 steam shunting locomotives and their gradual replacement by 1,200 diesel shunters by 1970. In addition to the 350-h.p. diesel-electric shunters, built by the railway workshops, there is also a requirement for many smaller diesel-electric, mechanical and hydraulic shunters with powers of from 150 h.p. to 300 h.p., which are being supplied by the British industry.

Another aspect of the modernisation plan, which is already proving popular with the public and profitable to the railways is the provision of diesel railcars and train sets for suburban and cross-country services; altogether 4,600 of these are required by the plan and by the end of this year 2,400 are expected to be in service.

#### Locomotive Industry

The British locomotive industry consists of about 25 well-known firms which design and build locomotives; while including the largest locomotive shops in Europe it also comprises manufacturers which can economically produce small batches for



Steam power at its height: A Beyer-Garratt 3 ft. 6 in. gauge GEA Class 4-8-2+2-8-4 of 62,851 lb. tractive effort for the South African Railways

delivery of the last few steam locomotives will be taken next year.

Besides considerable suburban electrification around Glasgow and in North-East London on the 25,000-volt 50-cycle alternating current system, there is a large scheme for East Anglia and work is actively proceeding on main line a.c. electrification from London to Liverpool and Manchester and from London to the West Riding of Yorkshire and on the East Coast route via York.

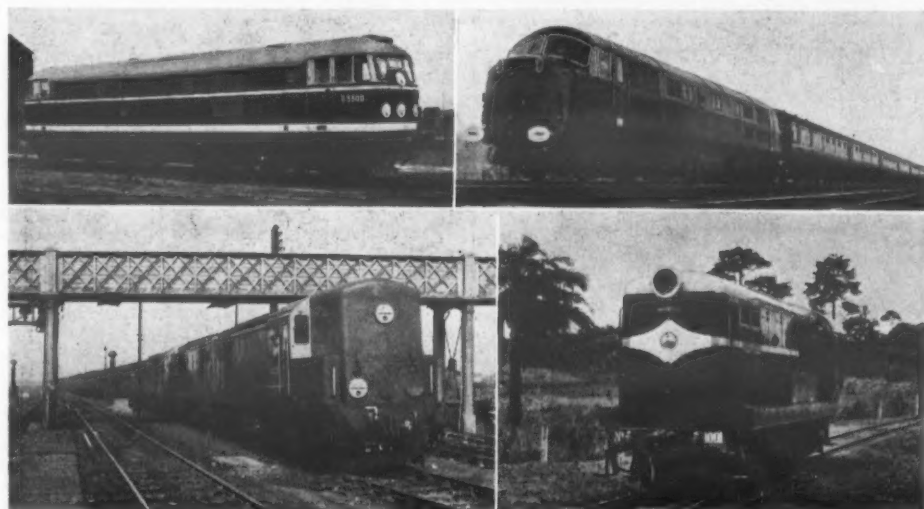
#### Electrification Orders

Orders have been placed with industry for 60 3,300-h.p. a.c. electric locomotives and 40 electrical equipments for incorporation in locomotives to be built in British Railways' workshops. In addition to locomotive traction, the modernisation programme includes for the supply of multiple-unit trains for these a.c. sections. Striking advances have been made in the past few years in the development of lightweight rectification equipment and semi-conductor type rectifiers are being fitted on certain of the a.c. multiple-unit trains.

The modernisation plan also provides for the extension of the Southern Region 650-volt d.c. system from the London suburbs to Dover and the East Kent resorts and the work on this aspect of the plan is well forward. Altogether some 1,100 electric locomotives will be required for the routes

special conditions of load, gauge or track. In addition there are many firms which specialise in certain items of ancillary equipment and numerous others concerned with the supply of raw materials, castings and semi-finished parts. These firms together form a comprehensive industry that has made a substantial contribution to railways everywhere; the remarkable total of 80 per cent of the output of the British locomotive manufacturers in 1956 was for export, an extraordinary testimonial to the confidence placed in us by our friends and customers overseas.

As with every major industry, research has played an important part in past achievements. Some of this research, such as went into several turbine and turbine-electric steam locomotives earlier in the century, produced at the expense of various manufacturers, played its part and was then superseded by the progress of diesel and straight electric traction. In more recent years, large-scale research has been devoted to the future possibilities of a solid fuel turbine machine; the gas turbine-electric locomotive with its possibilities of using diesel fuel, residual fuel oil or pulverised coal is having an extended trial on British main lines; and, although the future contribution of nuclear energy to railways would seem to be in the provision of cheap electric power supplies from central generating stations, the possibilities of



Brush 1,250-h.p. Type 2 main-line diesel-electric locomotive for British Railways; 2,000-h.p. Type 4 diesel-hydraulic locomotive built for B.R. by the North British Locomotive Co., Limited; below, B.R. Type 1 800-h.p. diesel-electric locomotives by British Thomson-Houston (with Paxman engine, Yorkshire Engine Company underframes and Clayton Equipment bogies) double-head a freight train; and, right, 750-h.p. English Electric diesel-electric locomotive on the 3 ft. 6 in. gauge in Ghana; similar locomotives are being supplied to Nigeria

scheduled to be electrified under the plan and these will, of course, replace a far greater number of steam locomotives.

#### Diesel Needs

While the utilisation of electric traction effects a long-term saving over steam traction through reduced operating costs, providing, of course, that traffic density justifies the high capital outlay, diesel traction savings, although not as high as electric under intensive conditions, are nevertheless substantial and are immediate in that diesel locomotives can operate over existing track without requiring lineside equipment.

The modernisation plan requires 2,500 main-line diesel locomotives and, so as to ascertain the types of locomotives most suited to the various duties required, British builders and the railways' own workshops were given orders for a number of locomotives of various powers ranging from 800 h.p. to 2,300 h.p. and having electric or hydraulic transmissions. Many of these "pilot scheme" locomotives are now in operation and further large orders have been placed with the industry including one for 22 Deltics, which are destined to replace 55 large Pacific steam locomotives on the Eastern Region. These 3,300-h.p. giants, the prototype of which was designed and developed by a British manufacturer and given extensive tests on British Railways, will, by 1960, be seen hauling the famous express trains of the Eastern Region.

#### Diesel Hydraulic

While many of the regions are investing in the familiar diesel-electric locomotive, Western Region has decided to concentrate on the diesel-hydraulic and deliveries of 2,000-h.p. units to this region have already been made and their performance on West Country routes will be observed with interest by locomotive engineers everywhere.

Diesel shunting locomotives have, as already stated, been used on British Railways for over

mobile nuclear plants, already used in shipping applications, are not being overlooked. Intensive practical research into the perfection of details to add still more to long trouble-free life and to take performance still higher is also a prominent feature of the industry's programmes.

We are a highly competitive industry, proud of our achievements and are confident of our ability to lead the world in all aspects of this most vital field.

### Forthcoming Events

- September 13-14.—Railway and Canal Historical Society. Visit to remains of Somerset Coal Canal and railways. Dorset and Somerset Canal, broad gauge G.W.R. architecture and Kennet and Avon Canal features. Based on Bradford-on-Avon.
- September 14.—Norbury Transport and Model Railway Club. Hastings trolleybus tour.
- September 17.—Institute of Road Transport Engineers (Western). Visit to Austin Motor Co., Limited.
- September 17.—Institute of Petroleum. Paper by Dr. T. Salomon (Institut Français du Pétrole), "Harmful Effects of Electrostatic Changes on Machinery and Lubricating Oils." At 61 New Cavendish Street, W.1.
- September 17.—Norbury Transport and Model Railway Club. Paper by Mr. C. Gammell, "Some Irish Travel Experiences." At St. Stephen's Church Hall, Winterbourne Road, Thornton Heath, 7 p.m.
- September 20.—Permanent Way Institution. Visit to London Airport.
- September 22.—Historical Model Railway Society. Paper by Mr. R. G. Dettmar, "Locomotives and Leprechauns." At Railway Tavern, Liverpool Street, E.C.2. 7 p.m.
- September 25-28.—British Railways (Southern Region) Lecture and Debating Society. Weekend visit to Scotland including Thornton Marshalling Yard and the Forth Bridge.
- September 25-October 4.—Commercial Motor Transport Exhibition. At Earls Court.
- September 28-October 7.—International Railway Congress. At Madrid.
- September 29.—Passenger Vehicle Operators Association. Annual dinner-dance. At Grosvenor House, London.
- October 2-12.—International Motor Show. At Paris.
- October 4.—Omnibus Society. Annual dinner. At Clarendon Restaurant, Hammermith, W.6. 7 for 7.30 p.m.
- October 13-15.—Road Haulage Association. Annual conference. At Torquay.



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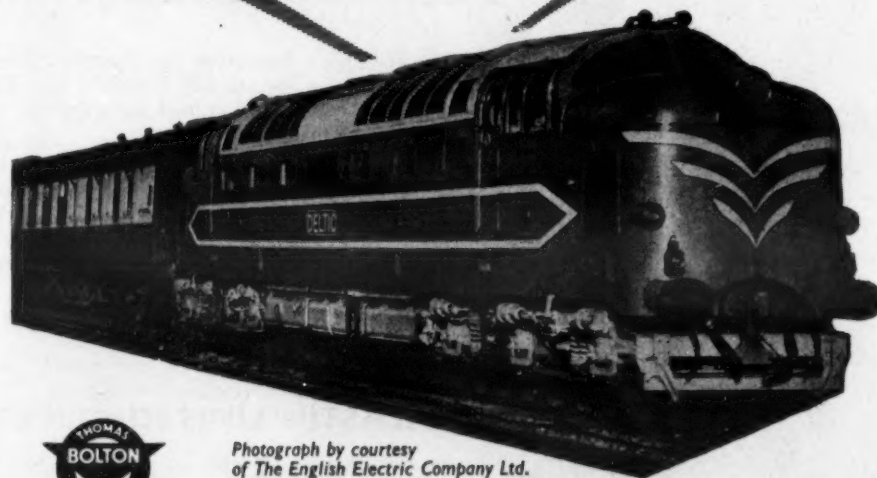
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commutator bars and segments were used in the generators, main motors, and auxiliaries.

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Photograph by courtesy of The English Electric Company Ltd.



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## NEW FROM B.M.M.O. Integral Double-Decker

### STYLISH C5 COACH

ALMOST simultaneously the fertile design department of the Birmingham and Midland Motor Omnibus Co., Limited, has brought two new types of vehicle into service. One is a more refined and stylish coach, the C5, which has the same structure as the S14 and S15. The first batch is to comprise 65 vehicles. The other is the long-awaited integral double-decker, designated D9, and with seating capacity raised to 72. This seems a good figure to aim at on densely trafficked interurban routes. The vehicle also retains the orthodox and well-tried rear entrance, which in our view has the virtue of avoiding the queue confusion we have sometimes observed when front and rear entrance buses alternate at picking-up points.

We are indebted to Mr. Donald M. Sinclair, general manager, Birmingham and Midland Motor Omnibus Co., Limited, for the information on which the following description is based. The chief engineer of the company is Mr. E. C. Tuff.

#### Introducing the D9

Since the introduction by B.M.M.O. in 1953 of the S14 single-deck vehicle and the successful performance under service conditions of over 250 vehicles of this type, the design of a double-deck vehicle incorporating the same advanced features as the S14 has been under consideration. The result has been the development of an entirely new 72-seat double-deck vehicle designated the D9.

Built to the maximum permitted dimension of 30 ft. by 8 ft., the D9 is of integral design and with the exception of the exterior panelling and alloy stress panels, is of all-steel construction. As on the S14, variable-rate rubber suspension has been employed throughout, with the front wheels



The B.M.M.O. C5 coach and the integral D9 double-deck bus

independently sprung. In the design of the suspension layout, vehicle stability together with riding quality has been carefully considered. The success of the chosen arrangement is demonstrated by the fact that the vehicle has been successfully tilted to over 30 deg. Disc brakes have been fitted to all road wheels and a transmission handbrake has been incorporated.

#### Two-Pedal Control

The D9 is powered by a 10.5-litre vertical engine with six cylinders of 4.88 in. bore by 5.7 in. stroke of B.M.M.O. design and construction. C.A.V. long stem-type injectors with four-hole nozzles are employed. The C.A.V. fuel pump has 9-mm. elements, two-speed centrifugal governor and diaphragm-type lift pumps. Fuel consumption is 0.358 pints per b.h.p./hr. at maximum torque. Driver fatigue has been reduced by the employment of two-pedal control, made possible by use of a combined fluid and centrifugal clutch which comes in at 800 r.p.m. in conjunction with an

electro-hydraulic Self Changing gearbox with finger-light five-way control. Gear ratios are 4.28, 2.43, 1.59 and 1 to 1; reverse is 5.97 to 1. The final drive is by an 84-in. centre worm and wheel, the ratio being 5.2 to 1. The brakes, front and rear, are hydraulically operated Girling disc type with continuous-flow servo assistance. The handbrake works on discs on the transmission by cable-operated twin bisector units.

The body, particularly at the front, is of a completely new style providing both excellent forward vision for the driver and engine accessibility. The rear entrance has double jack-knife power-operated doors. For the interior finishing, extensive use has been made of Formica or Darvic, thus eliminating the need of repainting. The interior appearance has been further brightened by the adoption of peony and white as the colour scheme.

#### Glass Fibre Cushion Frames

Seating capacity has been limited to 72 (32 down, 40 up), although if required this can be increased

slightly. The use of a rearward-facing transverse seat in the lower saloon has been avoided. Interesting features of the seats is that the squabs have been trimmed so as to give the impression of individual seats, and the seat cushions have been mounted on glass fibre frames. Actual seat frames are of the Accles and Pollock tubular type. Cushion filling is a foam plastics material; moquette trimming is used in the lower saloon and vinylite upstairs. Particular attention has been paid to saloon ventilation and heating, individual heaters being provided in each saloon. There are 20 twin sliding lights in the top half of each main window and Auster louvre lights at the front of each saloon.

#### Coach Features

The C5 37-seat coach is powered by a B.M.M.O. horizontal six-cylinder 8-litre diesel engine of 4.45 in. bore by 5.25 in. stroke. It has a fuel consumption of 0.35 pints per b.h.p./hr. at maximum torque output. The C.A.V. fuel pump has 8-mm. elements, a two-speed centrifugal governor and diaphragm-type lift pump. There is a single dry-plate clutch of 15½-in. diameter driving a B.M.M.O. DB4 constant-mesh gearbox, in which the ratios are 4.55, 2.75, 1.617 and 1 to 1, with a 5.88 to 1 reverse. The fully floating rear axle has hypoid bevel drive and a ratio of 4.78 to 1. Brakes and the Metalestik rubber suspension resemble the double-decker closely.

Although the same structure as an S14 has been used as a basis, the front and rear body framework has been redesigned to coach styling. Extensive use has again been made of glass fibre, the complete roof being made in one piece. To improve drivers' visibility and obviate reflection from the interior lights a lantern-type windscreen has been specifically designed and fitted. A hinged coach-type entrance door is placed forward of the front wheel, and conforming with the latest M.O.T. regulations, the emergency door is situated in the rear offside bay. Below the emergency exit a recessed folding step is incorporated. Luggage accommodation is provided by a rear boot fitted with a one-piece door, hinged at the top and balanced by C-springs. The coach exterior is finished in the company's standard coach livery of red and black.

#### Comfort

Particular attention has been paid to the interior finishing and passenger comfort. The seats which have individual adjustable headrests are trimmed in Linton Malton moquette with red vinyl borders. A matching shade of nylon-rayon material has been used for the seat backs and also the interior lining panels. Inner roof lining panels are of perforated metal, sprayed cream. As a further refinement to improve passenger comfort a glass fibre sound absorption material is placed between the inner and outer roof skins, thus further reducing the interior noise level. This material also acts as a thermal insulator.

Interior ventilation is by means of two bulkhead ventilators in conjunction with hopper-type ventilators in the side windows. The formation of the hopper ventilators makes an interesting feature in that the air is directed from the side ventilators over the surface of the roof above the luggage rack. Should it be desired, under particularly hot conditions, the air can be made to flow under the luggage rack, as in normal practice. The results obtained by this arrangement are the elimination of draughts. There are three Clayton-Dewandre S12-8 recirculatory heating units, with demisters fitted to the front screens.

#### PUBLICATIONS RECEIVED

SELF-CHANGING GEARS, LIMITED, AND THE WILSON GEARBOX. A new publication by Self-Changing Gears, Limited, Lythalls Lane, Coventry, which covers the historical development of the Wilson epicyclic gearbox and describes and illustrates some of its many applications in road and rail traction and marine fields.

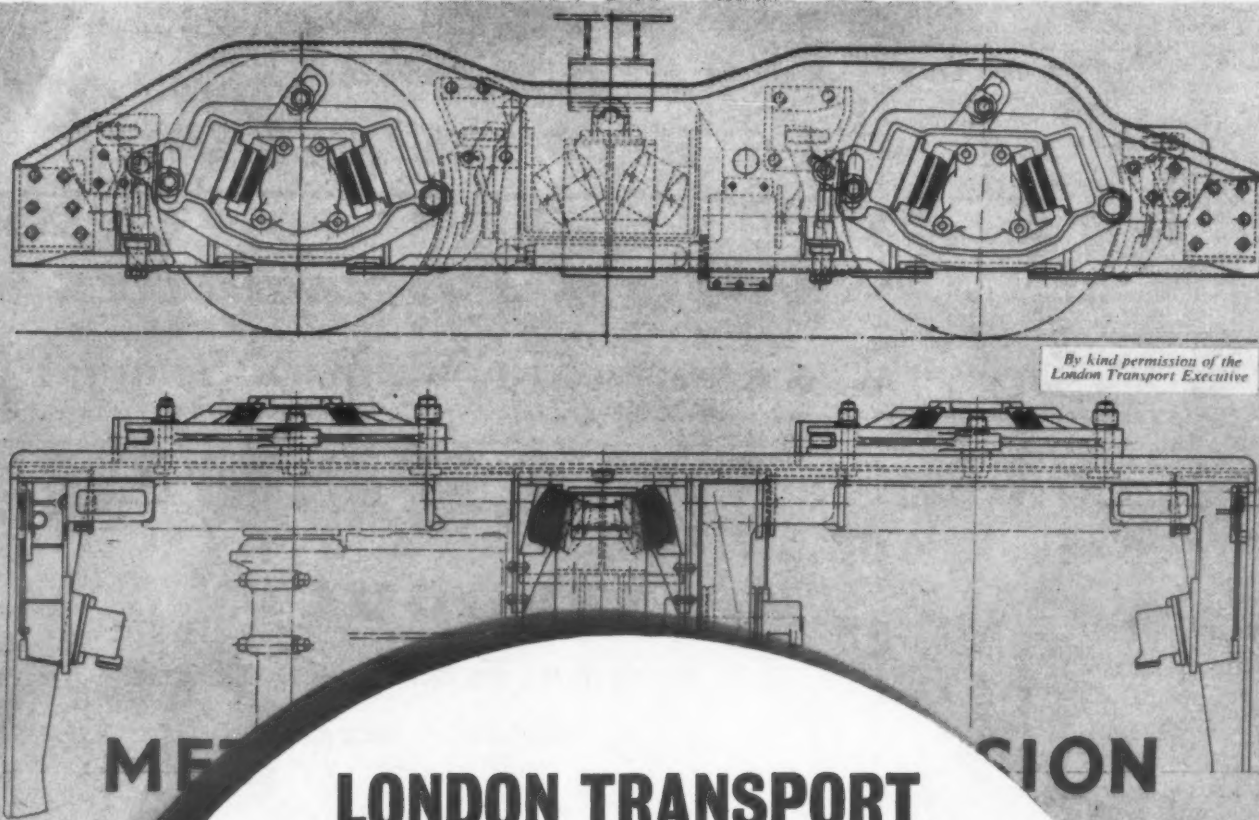
B.I.C.C. FEEDER PILLARS. A new publication, No. 36, by British Insulated Callender's Cables, Limited, copies of which are available free of charge from any B.I.C.C. office, describing and illustrating the company's two classes—standard and dwarf—of feeder pillars.

CLAW-TYPE CABLE CLEATING SYSTEM. Full information on the versatile cable-cleating system developed by B.I.C.C. is given in a new illustrated brochure published by British Insulated Callender's Cables, Limited, 21 Bloomsbury Street, London, W.C.1, copies of which are available free of charge from any of the company's offices.

ROUTES TO AUSTRIA. Published by the Automobile Association as a companion booklet to those on routes through France to the Riviera, the Costa Brava and to Switzerland, this new guide offers a wide choice of outward and return journeys via the Rhine, the Black Forest and Switzerland to and from Austria. Strip maps and directions are given for both principal and alternative routes and town plans, tables of meteorological readings and descriptive notes on the chief resorts and other places of interest are also incorporated.

ENGLISH ELECTRIC TRACTION. With over 12 months elapsed since the last edition of this attractive book published by the English Electric Co., Limited, Marconi House, Strand, London, W.C.2, it is natural that prominence is given to the equipment supplied for the modernisation of British Railways, which is now gathering momentum. Appropriately, the cover picture shows the *DeLia*, the most powerful diesel-electric locomotive in the world, which has successfully completed two years' intensive service trials with the London Midland Region, with the result that an order was recently placed by the British Transport Commission for 22 similar locomotives. Other English Electric-built B.R. classes are included and many of those built for operators in various parts of the world.

LEAD NEWS No. 5. Issued by Lead Development Association, 18 Adam Street, London, W.C.2, this edition contains illustrated articles on a wide variety of subjects. These include an authoritative description of the recently introduced method of smelting mixed lead and zinc charges by the improved vertical furnace method; an article on recent developments in this country in the production and usage of mechanically made homogeneous lead—principally for the chemical engineering industry; and an account of some recent developments in soldering, including the tinning and soldering of both cast iron and stainless steel. Other topics covered include corrosion prevention, a new Oldham battery, vibration and noise control and machining properties of leaded steels.



## LONDON TRANSPORT SPECIFIES

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## AXLEBOX and BOLSTER SUSPENSION FOR NEW TUBE TRAINS

London Transport Executive has specified Metalastik Rubber Suspension for the 532 Piccadilly Line Cars for which the Metropolitan-Cammell Carriage and Wagon Co. Ltd. are the main contractors.

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# LABOUR RELATIONS

## In Municipal Passenger Transport

By Councillor C. BLACKWELL, Chairman, Manchester Corporation Transport Committee\*

AT the present time in the municipal passenger industry there are two national negotiating bodies, the National Joint Industrial Council for the Road Passenger Transport Industry, dealing with the wages and conditions of service of drivers and conductors, handymen and cleaners, and the National Joint Council for Craftsmen, dealing with matters affecting the craftsmen in the industry. The first of these councils is by far the older, having attained its majority this year, and having its beginning in an earlier body formed shortly after the 1914-18 war. The National Joint Council for Craftsmen is a much more recent body, having been set up only towards the end of 1950. Both councils have virtually the same objects, namely "to secure the largest possible measure of joint action between employers and employees by the regular consideration and settlement of matters for the wellbeing and development of the industry as part of the national life." The questions to consider are: Is this being achieved? If so, is it being achieved in the most satisfactory way? Can anything more be done to improve present machinery in order to assist in attaining more easily the objects of the two councils?

The Federation of Municipal Passenger Transport Employers was set up in 1950 for the purpose of acting as the employers' trade union. The executive committee purports to achieve a fair proportionate representation from each area, and to secure that the number of representatives appointed bears relation to the subscriptions paid and to the number of undertakings in each area. The actual representation is, I believe, still in the melting pot, but is the right balance being obtained, particularly between the large undertakings and the small undertakings, and between the lay representatives on the executive committee and the managers? It seems to me that there should, and must be, a representation of the larger undertakings more nearly in proportion to the number of employees in each undertaking.

### Differential Recognition

Efficiency is not the prerogative of the larger undertakings (I have never contended it was) but the other factors affecting wage rates—more difficult operating conditions and highly competitive alternative employment—do obtain especially in the large industrial town, and should be recognised. As for efficiency, transport seems to be the only major industry where it is not rewarded as far as the men are concerned. I know the difficulties, but efficiency cannot be achieved without effort on the part of the men as well as on the part of the management. The men's direct contribution may take the form of agreeing to maintain high scheduled speeds, or to a high proportion of one-man bus operation. Whatever it is, it should be recognised financially. If it is right that London should have a differential, surely the same principles apply in respect of the large industrial areas which have the same problems.

The proportion of lay representatives on the executive committee is also a matter for careful consideration. My own feeling is that the lay members should have at least equal representation. After all, they are the people who will have to steer through their respective councils any fares increases or other measures which may be necessary to meet wage demands or improved conditions.

### Trade Unions

The principal objects of industrial relations in the transport industry, as in every industry, is to give the greatest possible consumer satisfaction, and at the same time to provide a fair and proper return both to the management and to the men. In transport, consumer satisfaction may be said to consist of a combination of two conflicting factors, the lowest possible fares and the best possible service. The best possible service is itself not an absolute; it is capable of many interpretations, high frequency, large number of unremunerative but otherwise desirable services, high standard of vehicle and generous shelter accommodation.

The two bodies upon which the federation is represented, namely the National Joint Industrial Council for the Road Passenger Transport Industry and the National Joint Council for Craftsmen, brings the federation into contact with a general union, namely the Transport and General Workers' Union, and five craft unions. The Transport and General Workers' Union deals with the operating and certain maintenance categories of employees, whilst the craft unions deal solely with the craftsmen in the works and garages. Is this set-up fully satisfactory? There is no doubt in my mind that, coupled with incentives wherever practicable, one industrial union would go a long way to solving vexed questions so far as the municipal passenger transport industry is concerned.

### The Closed Shop

The T.U.C. have never done more than tried to obtain 100 per cent trade unionism by persuasion but they have closed their eyes to many official and unofficial strikes that have been called with the express motive of achieving the closed shop. But really, is either the T.U.C. or in fact the employer full of principle in this matter? Is it not expedient for many employers to assist in organising the recalcitrant rather than face a showdown whilst the trade unions plead that it is not fair to expect union members to work with non-unionists. Is it not becoming more and more the common attitude to sink individual principle for group interests?

I firmly believe that the man is a fool who cannot recognise the tremendous gains that the trade unions have made for organised labour and the power that membership gives, even to the individual, and I shall continue to use any amount of persuasion with example towards 100 per cent organisation. It is to the credit of most managements within the Municipal Passenger Transport Association that they recognise the need for 100 per cent trade unionism and that they do try to encourage the men to take an active interest in the affairs of the undertaking, through works and shop committees. If an employer sincerely desires the confidence and co-operation of his workers he must find ways of convincing them of his personal interest in their working affairs.

It is my experience that most shop stewards are anxious to share in the responsibilities attached

to the undertaking, realising that it is their job to obtain the best possible conditions. It is most discouraging to the moderate shop steward who finds that only the steward that "screams from the house-top" can extract anything from management. Unfortunately, some managements look on moderation in a shop steward as a sign of weakness and take advantage of it. That type of shop steward is often voted out of office. Workers also learn to despise weak managements.

### Plea for Area Schemes?

It may be that if we had regionalisation of transport there would be less opposition to and less need for varying rates of pay, as each region, I can assume, would be responsible for its own conditions of work. Certain it is that if regionalisation became a reality the amount of money saved as a result of more efficient scheduling of services, reduced administration, and the streamlining of staffs should be considerable and perhaps enough to provide a much better standard for those who remain in the industry. In any event, I feel sure that if the leaders of both sides of the industry would carefully and fairly consider the application of regionalisation they might find a basis to recommend to the Minister of Transport.

It is understandable that the majority of the undertakings look unfavourably on the "deviators" as they have become known in the past few years, but really is there any acceptable alternative to what was done by, say, Birmingham? That undertaking had a problem and constantly was seeking the aid of the undertakings within the federation and only in desperation did it deviate. At least that is how it appeared to me. There must surely be something wrong with a rigid policy which panders to the smaller undertakings and excludes the larger ones. If the federation still feels that the present policy is the best then it should face up to restoring the industry to the prewar position when the employees were in the highest grades of the national wages scale. I think the time is now ripe when we should take the necessary steps to ensure the return of Birmingham to the federation if only to hear of its experience without the federation. There would certainly be a lot for us to learn from each other.

### Avoiding Disputes

The machine is there for the purpose of avoiding disputes, not making them, but a close analysis over the years reveals a tendency to use the procedure at discriminatory stages. It is truly amazing how little the ordinary chap in the industry knows of the machinery that has been created for his use and the tremendous sacrifice made towards it. It is vitally important that employees should be aware of and really understand the procedure. It is not just the responsibility of the trade unions to educate their members in the procedure and the art of negotiations, but the employer has a duty to the undertaking in cultivating the interest of his employees around procedural matters.

I believe the time has come for the establishment of a special section within the personnel department for the dissemination of news relating to the working conditions of employees. Decisions of transport committees which mainly concern the employees should be displayed on the notice boards attractively and the finance of the department should be broken down in readable publications.

### Wage Claims

The present method of negotiations is no worse than that operating in the various industries except that there is a tendency to delay. It appears to be a long monotonous drag from the initiation of a claim to finality. True it is that all claims must be looked at on their merits, and the effect that a settlement might have on the industry, but surely the reason for some of the delay is to minimise the cost arising from any settlement. Would it not be more honest to settle claims on a retrospective basis.

The exact number of transport undertakings in the country operating systems of payment by results is not known to me but there are many who do so in works and garages. I think there should be a genuine approach to the application of piecework in some form or another in order to reduce the costs to the trade. It can be applied successfully with advantage to the men and to the undertakings. The introduction of any system of payment by results requires the utmost care and if labour relations are to be unimpaired can only be established by people who thoroughly understand the intricacies of transport and who recognise the men's rights within the negotiations. The present national agreements have been built round a system of day rates which may be regarded as the equivalent of in lieu rates in other industries.

### Success of Payment by Results

From our experience in Manchester we have learned that the correct method of approach can bring good results. There was a time when it was thought that the introduction of a piecework system in the engineering section of the works was something beyond negotiations but I am pleased to say that agreement in principle has now been achieved by the use of patience and a strong desire to gain the confidence of the workers. And what of the platform staffs? This is a problem that has created so much discussion over the years and will continue to do so. Some start has been made using revenue as the basis of a scheme as is the case in Manchester, for instance. Has it been a success? It is too early to say, but it has not been a failure so far as the men and their representatives are concerned. It is most unfortunate that the Suez crisis came along and fare fluctuations upset calculations, but labour relations have been much better since its introduction.

There seems no doubt that the biggest single incentive is material reward whether it be the weekly wage packet or prospects for promotion or both, but there are certain attractions due to the nature of the job itself—more individual responsibility, freedom from immediate direct supervision and the mixed blessing of ever-changing contact with the public. The great difficulty seems to be that the job is generally regarded as a blind alley, but is it more so than many industries? In one large undertaking the present position is that the ratio of the number of inspectors and supervisory grades to men is roughly about one to 20, and if men with more than 10 years' service are taken

(Continued on page 16)

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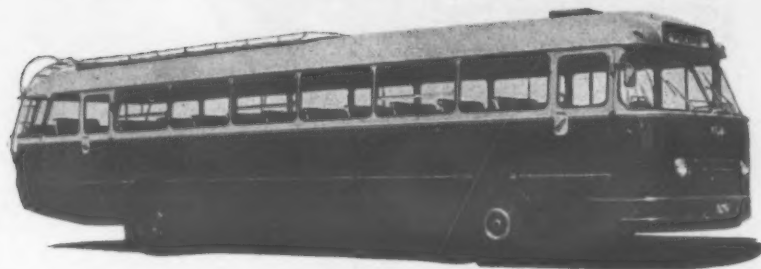
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\* Abstract of a paper presented to the annual conference of the Municipal Passenger Transport Association at Blackpool on September 9



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This order for 80 more Royal Tiger 'Worldmasters' follows up 220 Leylands already bought by the Polish Government. Their needs called for high efficiency vehicles with the best operating and economy performance available... so they had to have 'Worldmasters'.

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## NEWS FROM ALL QUARTERS

### Chinese Electric Locomotive

The first electric locomotive to be built in China has latterly been produced by the Siangtan plant in Hunan province. The plant plans to produce a further 30 this year.

### Drop in Malayan Railway Revenue

Malayan Railway revenue dropped \$M4,000,000 in the first six months of this year. This is ascribed to the current trade recession and increased road transport competition. The railway, carrying out strict economy measures, has stopped recruiting staff to replace those who have retired since May. Plans for renovation of buildings have been shelved and repairs to wagons which are not being used have been postponed.

### Australian Rolling Stock Export Group

Eleven major Australian manufacturers of railway rolling stock, diesel locomotives and equipment are included in the export group known as the Railway Rolling Stock Manufacturers' Association of Australia. Sales of Australian-assembled diesel-electric locomotives and rolling stock to Pakistan, Hong Kong, New Zealand, Ceylon and Malaya amounted to £A3,000,000 in the past two years.

### Future of Brussels Pavilion

The Federation of British Industries has entrusted George Cohen Sons and Co., Limited, with the disposal of the 60,000 sq. ft. glass-lined British Industry Pavilion which has already attracted four million sightseers at the Brussels Exhibition. It is stated that the Netherlands and Belgium are competing for the pavilion but it is hoped that, like the Crystal Palace in its day, this unique building may be re-erected at some worthy site in Britain.

### West German Waterway Traffic

Freight traffic by waterway in Western Germany has increased much more than that by rail during the past seven years. While annual freight traffic between 1950 and 1957 increased by only one-third on the railways, internal waterways doubled their performance. In 1950 71.9 million tons were transported on the waterways; that figure had risen to 142.3 million tons by 1957. The list of goods transported is headed by coal, in 1957 41.9 million tons. Mineral oil shows the most striking development from 3.4 million tons in 1950 to 13.2 million tons in 1957. Transport by water of ore almost trebled to 22.4 million tons.

### Stations Closing

The following London Midland Region stations will be closed to all traffic, or in some cases to passenger traffic, from September 15: Buxworth, Longsight, Warrington Arpley, Oakley, Embleton, Huyton Quarry, Halebank, and Marchington. Longsight will continue to be used for Belle Vue excursion trains. On the Scottish Region Wishaw South, Falkland Road, Bogside and East Grange stations close to passengers on that date. On the North Eastern Region the Malton-Driffield and Aire Junction-Bullcroft freight branch lines close on October 20 and on the Eastern Region Earith Bridge Station closes on October 6.

### German Private Owners Wagons

Recent figures issued by the German Federal Railway show that the number of privately owned railway wagons operating in Western Germany has risen in the past year to 40,000. However, the rise is only a small one and as the 1950 figure was 35,000 it seems that the demand for private wagons has reached something like saturation point. Most of these wagons are tankers, and the railways are coming under a certain amount of fire for not developing this traffic which, it is said, will soon begin to fall off owing to competition from pipelines and water transport.

### A 15-in. Gauge Railway Up for Sale

The inclusive price of £22,500 freehold is asked for the 15-in. gauge semi-scale model Ravenglass and Eskdale Railway, which has been put up for sale as a going concern. This includes 7½ miles of track, two steam and three diesel locomotives, together with rolling stock and buildings, 11 houses, a café, shop and various pieces of land. The owner is Narrow Gauge Railways, Limited; inquiries should be made to Mr. T. Graham, general manager, the Keswick Granite Co., Limited, Threlkeld, Keswick. The original section of this railway was opened (on the 2 ft. 9 in. gauge) in 1875.

### Dover Cross-Channel Traffic

Figures released by Dover Harbour Board for the first seven months of this year show that fewer Channel passengers are travelling under the British flag, while the traffic carried by the Belgian services, which have this year added two new vessels, the passenger ship *Queen Astrid* and the car ferry *Aartvelde*, shows a substantial increase. In July, the Belgian vessels carried a total of 255,580 passengers compared with only 198,669 last year. In the first seven months of this year, they carried 622,000 passengers compared with 506,000 last year. British boats in July carried 139,000 against 149,000 in July last year. Altogether, in the first seven months this year 1,188,429 passengers used the port—an increase of 18 per cent over the same period last year. Accompanied cars increased from 93,653 to 119,985.

### Rolling Stock and Equipment Exhibitions

This weekend (September 12-14) the Great Northern Line of the Eastern Region is staging a public rolling stock and equipment exhibition at Noel Park goods yard on the Seven Sisters—Palace Gates branch. It will include a wide variety of items ranging from the latest types of steam and diesel-electric locomotives to freight vehicles and civil engineering equipment. The first 1,160 h.p. diesel-electric locomotive destined for service on the Kings Cross suburban lines will be on view. A large part of the exhibition is devoted to freight wagons, containers and freight handling equipment. Sir Reginald Wilson, chairman of the Eastern Area Board, officially opens the exhibition today (Saturday). Public exhibitions of freight rolling stock are to be staged in the North Eastern Region at Stockton-on-Tees (September 23-25), Tynemouth (September 30-October 2), Hull (October 7-9) and Leeds (October 13-18). Leeds will also see modern passenger stock.



# Firestone

## TRANSPORT

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## COMMERCIAL AVIATION

### Viscount Earns Traffic

#### DC6As IN EUROPE

PASSENGER traffic between Auckland and Christchurch has increased by nearly 50 per cent since New Zealand National Airways Corporation introduced its Vickers Viscounts last February. The average passenger load factor has been 77 per cent, representing 46 seats filled out of 60. The traffic jump following the introduction of the Viscount is not a new phenomenon; it has already been demonstrated in at least 30 other countries. Frequently, however, such traffic increases are attributed to the ability of the Viscount to divert existing traffic from older, less competitive types of aircraft. The Auckland-Christchurch route, however, is operated only by N.Z.N.A.C. and provides proof that the appeal of propjet Viscount travel is sufficient to generate new traffic. N.A.C. operates one Viscount 800 series aircraft and has two more on order.

#### U.B.A. Abandons Penang Call

Union of Burma Airways, which has called regularly at Penang in the Federation of Malaya for some years, has discontinued this practice owing to having replaced its Dakotas on this route by Viscounts, which are too big to operate into Penang.

#### Eagle Gets Second DC6A

Mr. Harold Bamberg, chairman and managing director of Eagle Aviation, Limited, states that a second DC6A/B aircraft, G-APON, arrived at Blackbushe Airport on September 4. This aircraft, which Eagle will call the DC6A Eaglemaster, arrived fully converted for use in its dual role of a passenger or freighter aircraft.

#### Khartoum Airport Reopened

Khartoum civil airport, which had been closed for the resurfacing and strengthening of the runways and other improvements, was reopened on September 5. B.O.A.C. Britannia aircraft, flying between Britain and East, Central and South Africa, which had been re-routed via Kano, Nigeria, immediately resumed services through Khartoum.

#### B.E.A. Fare Reductions

From November 1 British European Airways is introducing winter "weekend" tourist fares between London, Manchester, Edinburgh, Glasgow and Belfast. The eight-day excursion rate will be £8 to Scotland and Northern Ireland and £5 to Manchester, cuts of 40.7 and 41.8 per cent respectively on normal fares. Tickets are available outward on Saturday or Sunday, for return the same weekend or the following one.

#### Swissair to Introduce DC6A

On November 1 Swissair will introduce its new Douglas DC6A cargo aircraft on the North Atlantic with twice-weekly flights over the route Switzerland-Manchester-New York. The company is thus reintroducing the call at Manchester which was discontinued last year. Except for the first flight, which will operate to a special schedule, services will leave Switzerland on Thursday evening and Sunday morning and Manchester on the same days. In the reverse direction they leave New York at 22.00 on Tuesday and 23.55 on Friday, calling at Shannon; a stop may also be made eastbound at Manchester if required.

#### Boeing 707 on London Flight

The first Atlantic crossing of Pan American Airways new jet air liner, the Boeing 707, ended at London Airport when the machine landed there early on Monday of this week. The primary purpose of the flight was to enable noise level tests to be carried out to determine whether P.A.A. will be allowed to operate the 707 into London or whether any restriction on its operation is necessary. Regular transatlantic services are planned to start before the end of the year but until approval has been obtained, the airline cannot announce a date for the inaugural flight. After a stay of 36 hours at London Airport, the aircraft left for Keflavik, Iceland.

#### British Air Traffic in April

During April, 1958, capacity ton-miles offered by British airlines on their scheduled services increased by 16.2 per cent. Total traffic carried rose by 5.4 per cent, the principal increase being in passenger ton-miles, as freight ton-miles decreased by 0.7 per cent and mail ton-miles went up only 1.7 per cent. B.O.A.C. provided 8.5 per cent more capacity ton-miles on scheduled services during the first 26 days of April, 1958, than in the first 27 days of April, 1957. Total traffic carried fell by 2.5 per cent. There was a fall of 10.1 per cent in the eastern area, but a rise in the western area of 14.7 per cent. Freight traffic increased by 24.1 per cent on western routes but decreased by 24 per cent on eastern routes. Passengers carried increased by 4 per cent, and these passengers flew 90.5 million passenger-miles, or 1.9 per cent more. The overall load factor fell from 61.6 per cent in April, 1957, to 55.3 per cent in April, 1958. B.E.A. offered a total of 16.1 per cent more capacity on scheduled services in April, 1958, than in April, 1957; capacity on international services increased by 20.9 per cent and on domestic services by 1.9 per cent. Traffic carried rose by 3.1 per cent; 121,889 passengers, or 2 per cent more, travelled on international routes and 83,667, or 8.5 per cent less, travelled on domestic routes. These passengers flew 52.8 million passenger-miles, or 4.3 per cent more on international services and 18.1 million passenger-miles, or 5.6 per cent less, on domestic services. The overall load factor fell from 63.3 to 56.3 per cent. Private companies operating in association with the corporations provided 13.8 per cent more capacity ton-miles on scheduled services in April, 1958, than in April, 1957; international capacity showed an increase of 17.8 per cent, but domestic capacity suffered a decrease of 15.5 per cent. Total traffic carried rose by 25.2 per cent on international routes, but fell by 26.1 per cent on domestic routes. International freight traffic went up by 31.6 per cent, while domestic freight dropped by 89 per cent, reflecting the suspension of domestic vehicle ferry services. Passengers carried totalled 29,609, or 3.8 per cent more, and these passengers flew 10 million passenger miles, or 15.2 per cent more. There was an increase of 22.4 per cent in the number of passengers carried on international routes and a decrease of 24.8 per cent on domestic routes. The overall load factor rose from 58 per cent in April, 1957, to 60.6 per cent in April, 1958. During April, 1958, the independent companies offered 27.9 per cent less capacity ton-miles on their inclusive tour services than in April, 1957.

## RAILWAY CONGRESS IN MADRID



*M. de Vos*

Monsieur Marcel B. R. E. DE VOS

General manager of the Belgian National Railways, Monsieur Marcel B. R. E. de Vos, who will preside over the International Railway Congress in Madrid, September 28-October 7, was elected president of the Permanent Commission of the International Railway Congress Association in January, 1953. Born in Ghent in June, 1901, he took his degrees as a civil and electrical engineer at the university in his home town and joined the Telephone and Telegraph service in 1925. After being appointed in 1936 senior engineer and in 1938 chief engineer, head of the Malines Telephone District, and the state-managed Telephone and Telegraph Administration, M. de Vos was transferred to the Secretary-General's office at the Ministry of Communications during the war and became Inspector General in the Transport division of that department in 1945. Whilst in office with the Ministry of Communications, he was successively appointed member of the Committee of the National Transport Regulation Board (1944), Government Commissioner for the Belgian National Light Railways (1945), president of the Brussels Transport Provisional Managing Committee (1946), delegate of the Belgian Government at the first and second sessions of the Inland Transport Commission of the International Labour Office in London (1947) and Geneva (1947) and at the International Union of Public Transport Congress in Montreux (1947). M. de Vos became general manager of the Belgian National Light Railways (S.N.C.V.) in 1947 and member of the Managing Committee of the International Union of Public Transport the same year. He took over his duties as general manager of the Belgian National Railways in October, 1952.

## L.M. ELECTRIFICATION

### Heavy Engineering Work

#### SUBURBAN DIESELS

PROGRESS with the conversion to electric traction of the railway between Euston and Manchester, London Road, and Liverpool, Lime Street, has been outlined by Mr. David Blee, general manager of the London Midland Region. Work on the conversion between Manchester and Crewe was well forward, he said. Colour-light signalling between Wilmslow and Slade Lane Junction was brought into operation on July 16 and was working satisfactorily. The overhead line would be energised at 25,000 volts during September so that the static equipment could be tested. Arrangements were being made for the training of drivers and motormen to begin in October. Trials with an electric locomotive will take place before the end of the year. Before 1960 is out electric services will be running between Manchester and Crewe and by 1963 they will be the order of the day between Birmingham, Liverpool, Lime Street, and Manchester, London Road.

#### Altered Train Times

Work is now proceeding day and night on the conversion; while this intensive track work is going on there will be numerous service slacks so that the present overall speed of trains will have to be reduced. The work on the track has made it necessary as from September 15, with the start of the winter timetable, to start all main-line trains out of Euston 10 or more minutes earlier than at present; trains to Euston from the Midlands and North will be started five or more minutes earlier. By introducing earlier departure times there is avoided, as far as possible, the need for wholesale alterations to connections, or the alternative of consistently late running.

"In making these very necessary adjustments to our timetable we have aimed to avoid as much inconvenience as possible to our customers," said Mr. Blee. "It is our desire and our duty," he said, "to give Britain a service second to none and these temporary adjustments to our present services are one of the steps in this direction."

#### Curtailments and Improvements

Passenger trains during the period September, 1958, to June, 1959, will run 950,862 miles a week. That represents a reduction in mileage of 20,000 a week compared with the same period in 1957-58. Certain local train services in various parts of the region are being reduced as from September 15. These trains, which are principally running at "off-peak" periods, command little public support, and it is therefore uneconomical to continue them.

The pattern of overnight sleeping-car services between Euston and Glasgow is to be improved. The 9.10 p.m. sleeper train Euston to Glasgow will, in future, leave at 10.0 p.m. arriving Glasgow at 6.45 a.m.—timings which a recent customer survey showed 75 per cent of users to prefer. In the reverse direction the 5.40 p.m. (5.45 p.m. Sundays) from Glasgow to Euston will leave at 6.50 p.m. and will be accelerated to reach Euston at 5.07 a.m. (Sundays), 5.19 a.m. (Tuesdays to Saturdays) and 5.27 a.m. (Mondays). The 7.45 a.m. Euston to Glasgow and the 4.0 p.m. Glasgow to Euston will be withdrawn. The Mid-day Scot, which has not previously run on Sundays during winter, will continue to operate on Sundays under the new timetable. It will leave Euston at 12.30 p.m. and Glasgow at 1.0 p.m.

#### St. Pancras Suburban Services

The St. Pancras suburban services are to be converted to diesel traction in 1959, announced Mr. Blee. This, he said, would be one of the largest multiple-unit diesel schemes which has yet been introduced in this country. An improved service would be given in the peak periods. In off-peaks, hourly services would be run between Bedford and St. Pancras, calling at all stations between Bedford and Elstree, as well as an hourly service between Luton and St. Pancras calling at all stations. In addition, an hourly service would be run between Kentish Town and Barking over the Tottenham and Hampstead and Tottenham and Forest Gate lines throughout the day in substitution of the existing steam services. The diesel operation will not be projected to Moorgate because of tunnel clearance on the Widened Lines of the Metropolitan.

#### New Rolling Stock

The project involves the construction of 120 diesel multiple-unit coaches, seating three and two across the gangway in open-type vehicles, with side doors between each row of seats. There will be sections partitioned off for non-smokers. The trains will be second-class only, will have transistor type of fluorescent lighting, and high-back seats for greater comfort. There will be toilets in one coach of each train, which will be made up in four-car sets. Eight coaches will be run in the peak hours. Each motor brake open second will seat 76 passengers; the trailers will comprise one seating 108 and another with two lavatory compartments seating 90, making a total of 350 on the train. The power units will be Rolls-Royce underfloor engines driving through torque converters. At 128 tons with 952 h.p. there will be about 7½ h.p. per ton of tare, giving good acceleration curves. The Bedford trains running fast to Elstree will cover the 50 miles in 72 min.

#### Diesel Train Depots

Special maintenance, cleaning and servicing facilities at a cost of £400,000 will be introduced at Cricklewood with sub-depots at Harpenden and Bedford. Between Harpenden and Bedford, to enable the improved service to be provided, goods lines will be converted to passenger lines and improved signalling will be introduced.

Mr. Blee added that the scheme would provide a modern transport service in this important area of London and its surroundings which would be ready for introduction by the end of 1959. The vehicles would, in fact, start coming off the production line at Derby next April.

Work has begun on a major extension of the agricultural implement factory of Massey-Ferguson (Great Britain), Limited, at Barton Dock Road, Stretford, Manchester. The main factory building, which was previously enlarged in 1955 to 300,000 sq. ft., is now to be extended by another 100,000 sq. ft. The extension will be used as a warehouse for finished machines and implements. Massey-Ferguson is also enlarging the spares warehouse building at Ashburton Road, Trafford Park, where a new building will house the punch-card equipment for the mechanisation of the material and production control records of the company's factories at Manchester and Kilmarnock.



# CROSS-COUNTRY BUS DESIGN

*For Maheila Bus Services in Sudan*

## M.C.W. BODIES ON ALBION REIVER CHASSIS

**N**OW going through the Metropolitan-Cammell shops at Elmdon is a batch of most interesting buses intended for heavy cross-country work in the Sudan. The Metropolitan-Cammell-Weymann bodywork is designed specially for the needs of the operator, Maheila Bus Services, and is mounted on modified Albion Reiver six-wheeled chassis powered by Leyland O350 diesel engines. The modified Albion Reiver PF107L chassis has 10.50 by 20 Dunlop RK7 rear tyres and 9.00 by 20 10-ply Highway type tyres at front. The Leyland engine develops 100 b.h.p. at 2,200 r.p.m., the maximum torque of 225 lb.ft. being exerted at 1,400 r.p.m. A five-speed gearbox is fitted and both axles of the rear bogie are driven. A 50-gal. fuel tank is part of the equipment and two spare wheels and tyres are provided—one each for front and rear—and are housed in an open compartment on top of the chassis at the rear, where they are padlocked in position.

### Body Framing

The M.C.W. body is of all-metal construction, with overall dimensions of 29 ft. 2 in. long, 8 ft. wide and roundly 11 ft. 3 in. high, laden; it is rigidly bolted to the chassis brackets at all mounting points, and the pillars are rigidly connected to floor bearers of 4½-in. deep steel channel sections in pairs. The pillars are of M.C.W. 16-gauge tubular steel section, connected to the steel longitudinal rails by gussets and brackets, and designed to take a solid riveted 16-gauge steel interior stress skin, running the full length of the bodyside. The front and rear ends are similarly constructed. A full width bulkhead, glazed above waist, separates the driver's cab from the saloon. The wheelarches are formed from mild steel angles and 16-gauge mild steel sheet. The floor is of ½-in. thick resin-bonded plywood covered 3.2 mm.

brown linoleum with three-pyramid Lite steel treads in the gangways and at the entrance. The floor covers are of 18-gauge mild steel sheet.

The exterior panels are of 18-gauge half-hard aluminium alloy sheet secured by wood screws. Vertical aluminium alloy moulds are provided at

Z-section carlines connected to the cantrails and pillar tops by steel brackets. The cantrails and purlins are of HE10WP light alloy. The centre portion of the roof is of 18-gauge half-hard aluminium alloy, with 16-gauge mild-steel corner panels running the full length of each side. The roof sheets are secured to carlines and purlins by solid rivets. The interior lining panels, including radiused corner panels, are of 18-gauge half-hard aluminium alloy sheet, lap jointed, fitted with cover straps and pop-riveted to the structure.

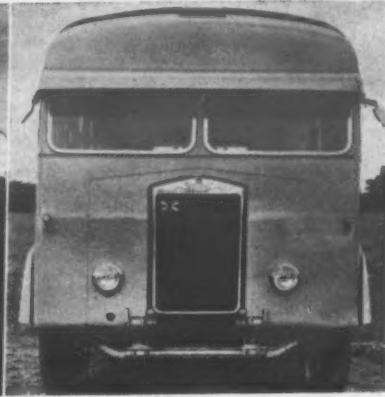
### Domes

The front and rear domes are of 16-gauge aluminium with lining panels of 18-gauge half-hard aluminium alloy sheet. A large-capacity luggage rack with slatted base is built up on the

is provided with a hinged opening ventilator. A hinged door, opening outwards, secured with a slam-type lock, and fitted with Slide-lock full-drop louvre and window glazed in ¾-in. thick Sundym toughened sheet glass, is provided at the front on the nearside. The steps are constructed of mild steel with chequered aluminium alloy side plates and risers, and ¾-in. thick hardwood treads fitted with three pyramid Lite steel treads and nosings.

### Emergency Exit

A waist-high partition of 16-gauge NS5 chequered aluminium alloy is provided to the rear of the entrance and is connected to the floor-to-ceiling stanchion. A hinged emergency exit door is provided on the offside at the rear, secured with two-



M.C.W. bodywork distinguishes this Albion Reiver, one of a fleet for Sudan Railways; interior showing jalousie windows; right, frontal appearance

all panel joints and horizontally at waist and skirt level. A deep louvre of the same material is fitted above bodyside and rear end windows. The rear bodyside skirt is swept upwards to give a ground clearance of 2 ft. 2 in. laden at the rearmost part of the body.

The roof framing is of 16-gauge mild steel

roof over the rear portion; an access ladder is fitted at the back. At the sides and forward of this rack a sun shield is provided, constructed of 18-gauge half-hard aluminium alloy sheet standing approximately 2 in. away from the main roof to provide a cooling air space. The roof over the driver's cab is insulated against heat and it

point locking gear with exterior handle and fitted with full-drop louvre and Slide-lock window glazed in ¾-in. Sundym toughened sheet glass.

The driver's cab is full width with access through hinged doors each side of vehicle, fitted with slam type locks and stainless steel pull handles on interior. The cab door windows are glazed with Sundym and incorporate a full-depth sliding glass. The windscreens are Auster single-panel type in brass chromium-plated frames glazed in ¼-in. laminated plate glass, and so arranged that they can be secured in a partially open position. There is a full-depth slider behind the driver and fixed glass on the near bulkhead.

The driver's seat is a semi-bucket type on Chapman's Leverex mark 101 fully adjustable mechanism; the cushion is of Dunlopillo and the squab rubberised hair, trimmed with washable brown canvas. A water tank of 9-gal. capacity, felt covered, fitted with filler cap and hand tap, is fixed on the nearside of the bulkhead in the cab. A deep metal sun visor is fitted above the windscreens and side quarter lights. Envelope type ventilators with a 9 in. by 3 in. opening are provided on the near and offside of the cab.

### Interior

All main bodyside windows are fitted with full-drop metal louvres and Slide-lock Sundym toughened sheet glass windows. The rear end windows are Slide-lock half-drop type glazed with Sundym in Clatonrite perimeter rubber. The seating capacity is for 44 passengers, all facing forward and arranged with three-passenger seats on the off-side and two-passenger seats on the nearside. The rear seats are on raised platforms in order to clear the wheelarches.

The seat frames are Deans' tubular type with wood slatted base and backs fitted with removable Latex foam rubber pads 2 in. thick and 1-in. thick Dunlopillo cavity sheet squabs. They are trimmed in washable detachable brown canvas. This enables the bus to be used for first or third-class passengers. The backs of the seats are fitted with stove-enamelled tubular passenger hand grabs. The ceiling and domes are stove-enamelled white and the lining panels below the waist are enamelled cream. Windows are fitted with radiused metal finishers, stove-enamelled cream; the floor covers are painted brown. The interior of the driver's cab is painted dark green with a matt finish to reduce glare. Stanchions and handrails are of mild steel tube covered white Doverite, with stainless steel sockets and brackets.

### Electrical

There are 14 Taw thief-proof recessed open reflector lamps in the radiused ceiling panels, and one in the cab. A Lewis Dixon step lamp is placed in the upper riser of the step well. A red stop light and two combined rear lights and reflectors are fitted at the rear of vehicle. Two C.A.V. Type BWN 24/8, 24-volt windscreen wipers are fitted and a Leyland standard switch box is arranged on the front panelling.

The Leyland standard instrument panel and saloon fuse and switch panel (supplied with the chassis) are provided. One red marker light is fitted at each side of the rear roof dome, as close as possible to the maximum width. The exterior of these interesting vehicles is finished in light battleship grey, using a four-coat hot spray process with I.C.I. Dulux paint. There is a red band along the waist line and the roof is completed in aluminium.

## LABOUR RELATIONS

(Continued from page 13)

the ratio becomes about one in 12. There is the further question as to whether the reward for these supervisory positions is itself sufficiently attractive. I am not alone in thinking that some tangible form of recognition for long service is due.

Is it considered a sufficient reward for a life's service to be presented with a certificate signed by the chairman or general manager of the undertaking? I think not. Surely the time is not far distant when consideration will be given to the introduction of a non-contributory pension scheme to replace the present superannuation scheme? I realise that is a matter for the local authorities as a whole, but a strong push from the M.P.T.A. might bring about the conversion.

One thing that emerged from the recent bus strike in London was to draw attention to the competitive strength of the private vehicle and the need for economy and greater efficiency. But what of the peak-hour services? Reduction of off-peak hour services by themselves must lead to a lower efficiency unless accompanied by a similar cut in peak hours. If labour turnover reverted to prewar figures then there would be a question of redundancy arising from reduction in services. Who should go from the industry?

## The versatile WAGON BEARING UNIT

The illustration shows a cast-steel bogie fitted with the Timken wagon bearing unit made by British Timken Ltd. This is fitted with two high-capacity Timken tapered-roller bearings, and is easily adaptable to various designs of freight cars, by the use of suitable horse-shoe adapters.

This application, carried out for British Phosphate Commissioners by Messrs. Bradford Kendall in Australia, shows the versatility of the wagon bearing unit, which is already being fitted on a large scale by British Railways.

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# OVERLAND TRANSPORT FROM SPAIN

## Development of Perishable Traffic

### WAGONS WITH INTERCHANGEABLE AXLES

ONE of the most remarkable features of postwar Europe has been the tremendous increase in the transport of perishables. The reasons for this development are readily apparent: the higher standard of living in most European countries has opened up new markets not only for foodstuffs which may be regarded as necessities, but also for luxury goods such as bananas, fresh fruits, and early vegetables; at the same time there has been a parallel improvement in agricultural techniques leading to greater productivity; and, finally, the progressive liberalisation in the exchange of currencies has facilitated the international exchange of products. The producer countries have of necessity been forced to export their goods in order to achieve a balance of payments, and at the same time the demand for those foodstuffs has grown in the consumer countries.

#### Speed Essential

Speed is the essential factor in the transport of fruit and vegetables to ensure that they reach the consumer in perfect condition, and it is for this reason that the railways have been the principal carriers of these traffics, the rapid increase in which has given rise to many problems. It is to the credit of the railways of Europe that they have success-

fully met the challenge by providing improved rolling stock fulfilling the technical requirements, by introducing speedy transits, by standardising packing and containers, by improving pre-refrigeration and icing techniques and by providing improved facilities at sending and destination points for the handling of the goods.

Foremost among the producer countries of fruit and vegetables is Spain, but until the year 1951 rail traffic between Spain and the rest of Europe was impeded by the difference in gauge, which necessitated transshipment from Spanish to European wagon at the Franco-Spanish frontier, with all its attendant evils: loss of speed, handling charges, pilferage, deterioration of the goods, immobilisation of the wagons, more costly packing.

#### Work of Transfesa

A Spanish limited liability company, Transfesa, found the solution and on January 24, 1951, it inaugurated at Hendaye an installation for the changing of axles, followed on May 15, 1951, by an identical installation at Cerbere. Each installation consists of two groups of four gantries which

are available (1957) 121,937 tonnes of oranges were exported in Transfesa wagons. Next in importance are grapes, of which 24,237 tonnes were conveyed in Transfesa wagons during 1957, followed by tomatoes (18,659 tonnes and new potatoes (16,187 tonnes). Apricots, onions, pears, plums, peaches, melons, beans and other fruits and vegetables were also conveyed in much smaller quantities. A special word is required about the tomato traffic. It is largely as a result of the initiative of the Transfesa company that the cultivation of tomatoes suitable for the English market has been introduced on the Spanish mainland and has developed into a major crop which is able to compete successfully with all other imported tomatoes in this country and elsewhere. Not only have existing traffics been increased, therefore, but new traffics have been introduced as a result of the facility for throughout transport by rail.

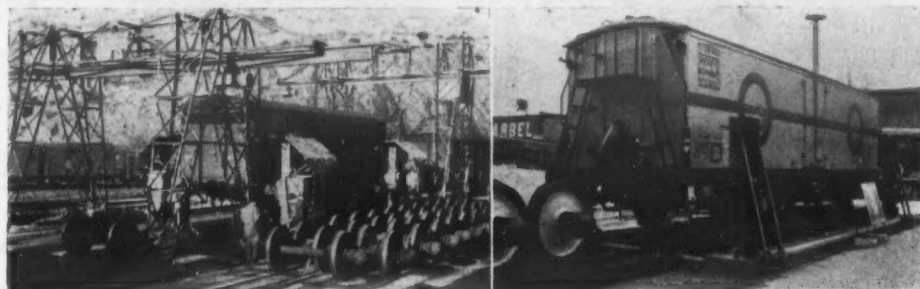
#### Destinations

The principal destination country for Transfesa traffic, as for perishable traffic generally emanating from all producer countries in Western Europe, is Western Germany. Over 82,000 tonnes of Spanish produce entered that country in Transfesa wagons during 1957, of which 56,000 tonnes consisted of

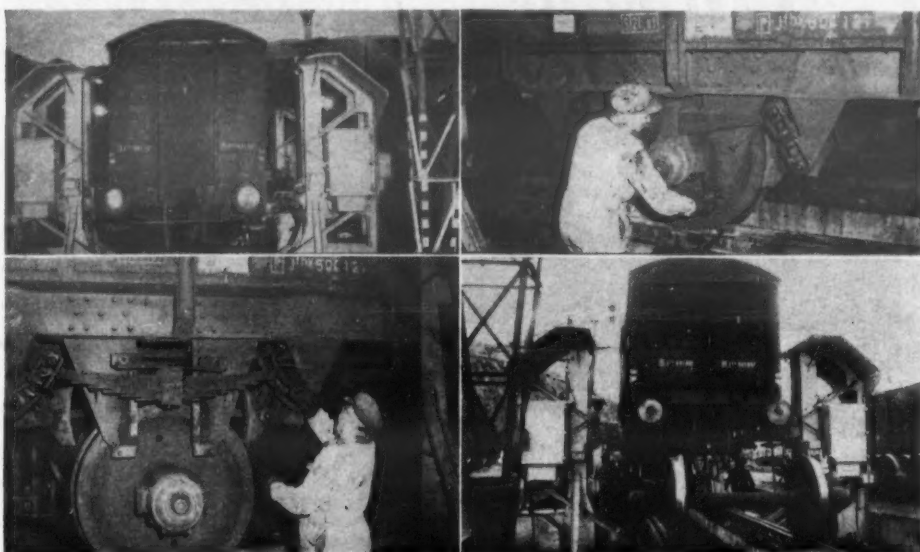
oranges. Great Britain is the second largest importer with a total of over 43,000 tonnes in 1957 and it is interesting to note that although we took very few oranges by the overland route (only 7,000 tonnes) we imported by far the largest proportion of the Spanish tomato (15,000 out of a total of 18,000 tonnes) and potato (12,000 out of a total of 16,000 tonnes) crops. In the league table of importers of Spanish produce, France came third (30,000 tonnes), Belgium fourth (24,000) and Switzerland fifth (10,000). Traffic in Transfesa wagons also goes as far afield as Norway and Sweden and for the first time in 1957 the Iron Curtain was crossed by Transfesa wagons in taking 262 tonnes of oranges and grapes to Czechoslovakia.

#### Developmental Possibilities

The development of this traffic has not gone unnoticed by competing means of transport and direct sea has made strenuous efforts, not entirely unsuccessful, to capture the grape traffic which otherwise has a long haul by rail across Spain. That the other traffics are to a great extent maintained and even developed is due to the much speedier



Stock of standard-gauge axles for Transfesa wagons at Spanish-French frontier; right, Transfesa wheel-changing demonstration at Brussels Exhibition



Interchanging axles on Transfesa wagons: The wagon in position between the gantries; the axle securing plate is removed; below, the body of the wagon is lifted, leaving the Spanish gauge axles on the rails and the position of the brake shoe is altered to fit the standard gauge; right, the 5 ft. 6 in. gauge axles are withdrawn and 4 ft. 8 1/2 in. gauge axles rolled in

permit two wagons to be handled simultaneously and their axles changed within the space of 10 minutes.

At that time (1951) the Transfesa company had in service a total of 162 refrigerator wagons and 110 ventilated wagons to the English loading gauge, capable of being shipped by the Dunkerque-Dover ferry service and of running over the British Railways system. Subsequently, between December, 1954, and March, 1955, an additional 1,000 ventilated wagons, all to the English loading gauge, were brought into service. The average load of the Transfesa rolling stock varies between 16 and 17 tons in the ventilated wagons and between 8 and 10 tons in the refrigerator wagons.

#### Increased Traffic

The phenomenal increase in traffic as a result of the entry into service can be gauged by the fact that in the last year of operating with the restricted fleet of vehicles a total of 4,261 wagon loads was exported from Spain to the rest of Europe, whereas in the first full year of operating with the increased stock (1955) the figure was 13,081 wagon loads. February, 1956, saw the disastrous frost in Spain which ruined the orange crop and as a result there was a slight decrease in the total traffic exported (12,485 wagon loads), but in 1957 the increase in traffic was resumed, the figure being 13,871 wagon loads.

The principal commodity exported is, of course, oranges and taking the latest year for which figures

transit overland (Alicante tomatoes can be on sale in Covent Garden four days from being packed), the better condition in which the produce reaches the market, and the controlled, even flow of produce which is only possible in wagon loads.

The future offers even greater possibilities of development. With the partial lifting of the Iron Curtain new markets are opened up in Eastern Europe. With the introduction of the Free Trade Area the possibilities of return loads to Spain are greatly increased. With the full co-operation of the railway administrations of Europe it is the intention of the Transfesa company to achieve a constant user for its stock of wagons throughout the year, and as a token of its confidence in the future it intends to construct another thousand wagons during the next two years. All of these will be to the English loading gauge.

The Plessey Co., Limited, on September 1 introduced the Blue Arrow service, which now provides express delivery of small quantities of standard items of electrical connectors required urgently for prototype work and other similar requirements, this system is designed to eliminate needless quotations and correspondence. Electrical engineers are being provided with specially printed Blue Arrow order forms, or for those using their own order forms, a distinctive sticker and a special department has been set up to deal with these priority orders.

# CRAVEN

## THREE CAR DIESEL TRAINS for BRITISH RAILWAYS



Included amongst orders received for over 400 Diesel Railcars for The British Transport Commission's Modernisation Programme are a number of triple car units one of which is illustrated here.

Second class saloon looking forward into drivers compartment.

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### BTH Express Locomotives

Faster journeys and cleaner trains and stations are just a few of the advantages which will be enjoyed by passengers on Britain's electrified railways. While work on the overhead line goes ahead, BTH are building twenty-five complete 3,300 h.p. locomotives and electric traction equipment for another forty, all of which will operate on the 25 kV, a.c. system. Trial runs will begin next year.

The locomotives are being equipped with BTH mercury-arc rectifiers and associated transformers, traction motors, and the latest type of camshaft tap-changing control.

BTH are also working on another British Transport Commission order for thirty-five sets of a.c. electric equipment for multiple-unit stock, incorporating germanium rectifiers. This is the first bulk order of its kind in the world.



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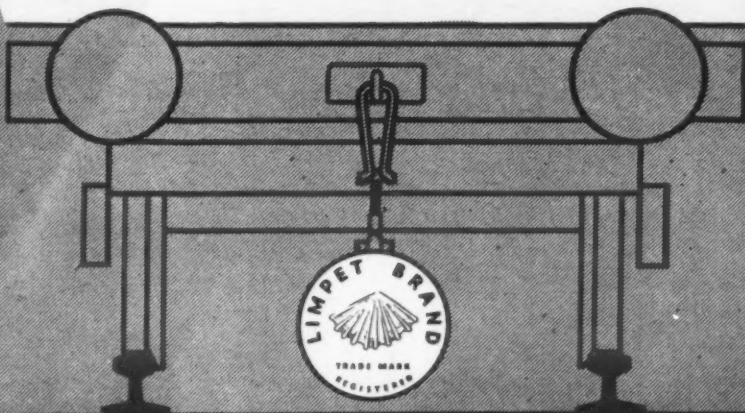


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## RAILWAY CARRIAGE AND WAGON BUILDING

*The Industry in Great Britain*

By H. N. EDWARDS, Chairman, Railway and Carriage and Wagon Building Association

THE railway carriage and wagon building industry in Great Britain has made an important contribution to the development of railway systems throughout the world and, for more than one hundred years, has built up a record of enterprise and experience in designing and constructing various types of railway vehicles for almost every existing condition and climate. Today extensive factories are situated in most of the principal manufac-

generally accepted sense is not possible within the industry owing to the differences in track gauges and the many different types required, some contracts for large numbers of a particular type, and repeat orders, do provide scope for manufacture on these lines. A five-year contract for a total quantity of 90,640 16-ton mineral wagons for British Railways has recently been concluded, and 14 firms in the industry have been participants.

A smaller number of member firms concentrate also on the building of passenger coaches, and



One of the first-class motor coaches incorporating a baggage van built by Metropolitan-Cammell Carriage and Wagon Co., Limited, for the electric services of South African Railways and Harbours on the Rand

turing centres of Great Britain and the sixteen member firms of the Carriage and Wagon Building Association have a compact team of designers and technicians with a unique experience of the rolling stock requirements of both home and overseas customers.

In the last ten years the firms more particularly concerned with export have devoted a large proportion of their manufacturing capacity to the supply of over 50,000 wagons to many overseas countries, including South Africa, Rhodesia, East and West Africa, Egypt, Sudan, India, Burma, Malaya, Australia, New Zealand, Argentina and Brazil. In addition, the industry has supplied over 204,000 in the last ten years for service in Great Britain.

Although mass production of wagons in the

large shipments in recent years have included motor and trailer coaches for various electric suburban services of the South African, Ceylon, Indian, Australian, New Zealand, Brazilian and Portuguese Railways, besides rapid transit cars for the Toronto Subway System in Canada. Main-line passenger coaches have also been dispatched to South Africa, Rhodesia, Egypt, East and West Africa, Iraq, Ceylon, Malaya, Peru and Antofagasta, while regular deliveries of carriages for British Railways have been maintained.

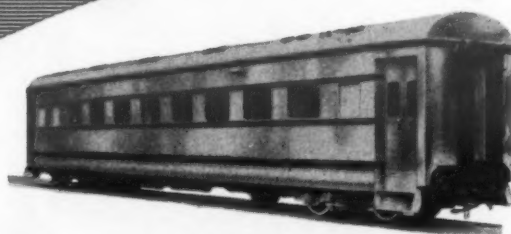
### Value of Exports

The total value of exports by the industry over the last ten years has averaged £10½ million per annum. Although no recent deliveries of rolling stock have been made to Spain, the connection with members of the Association goes back nearly 70 years and Pullman coaches supplied by British

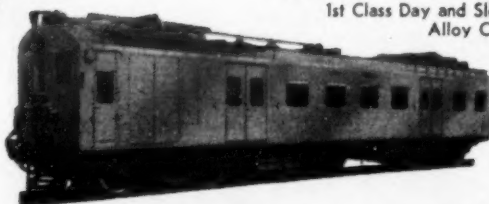
(Continued on page 19)



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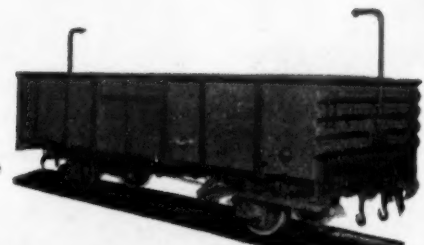
BRITISH RAILWAYS  
Diesel Railcar.



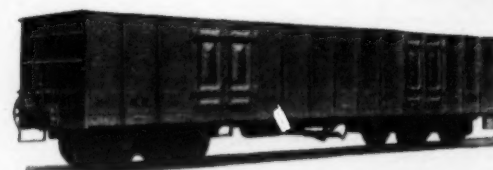
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builders still give good service on the Spanish main lines.

British standard practice has had an important influence on railway construction and operation throughout the world and this is equally true in regard to the design and manufacture of passenger and freight vehicles. The industry has always kept in the forefront of any new development, chief of which has been the need to achieve a degree of weight reduction to counteract continual rising operating costs.

#### Towards Lighter Vehicles

Several illustrations of this have occurred in lightweight coaches supplied to India, Portugal, East Africa, Canada, Peru and South Africa. Not only have light alloys been used with a view further to reducing tare loads consistent with the maintenance of strength for both suburban and main-line traffic, but also lightweight steels have been introduced. The most recent example of this was the award to the principal carriage and wagon builder of this country of 349 lightweight all-steel electric suburban coaches for the intensive Reef services of the South African Railways.

The recent accent on dieselisation has brought a new development to the industry. The introduction of diesel railcars has proved popular with the British public, and four firms in the industry have supplied and are continuing to supply large quantities of this type of vehicle under the British Railways modernisation plan. A total of 1,672 railcars have so far been ordered from the carriage builders of this association. The types of design incorporated have the same underlying aim in view—to save weight commensurate with basic strength for the heavy service they have to perform.

#### Improving Amenities

In an endeavour to improve the interior comfort and amenities of main-line coaches for British Railways, four firms produced individually their

aluminium unpainted exterior panelling. The provision of these prototypes has resulted in the placing of a contract for 532 new tube cars for the replacement of the Piccadilly Line stock.

Two firms have also undertaken several important contracts for diesel-electric locomotives for railways in Australia, Eire, Ghana, Sierra Leone and the British Transport Commission in conjunction with suppliers of motive power and electrical equipment.

#### Postwar Demands

The postwar demands for new rolling stock came at a time when steel supplies were not sufficient to meet them. Consequently it has taken a longer time than anticipated to overhaul all the shortages and renewals which became necessary as a result of the 1939-45 war. Nevertheless, as the various programmes of development on many of the world's railways became known, so did the competition from other countries become more severe. The industry today is experiencing even fiercer competition for both export and home orders—not only from European, Japanese and Australian

manufacturers, but also from firms who have established themselves in countries which previously imported the bulk of their rolling stock. Every effort is therefore being made to meet this competition by improved designs and manufacturing methods, coupled with increased productive effort to reduce costs. At the same time the industry is determined to maintain the quality and reliability of its products based on that craftsmanship and technical ability which has won for British-built rolling stock such a high reputation on railways throughout the world.

#### Diesel-Electric De-Luxe Sets

An example of this was the award of a contract by the British Transport Commission to one of the firms in the industry to construct five diesel-electric de-luxe main line express trains which will



Main saloon of prototype first-class carriage designed and decorated for British Railways by Birmingham Railway Carriage and Wagon Co., Limited



A 7,056-gal. metre-gauge tank wagon by Charles Roberts for the Kenya section of the East African Railways and Harbours system with a tare of 20 tons 9 cwt.

own ideas in the form of eight special prototype vehicles. These caused interest among the authorities of the British Transport Commission, and as a result of further deliberations some new features for standard coaching stock may evolve.

Three prototype seven-car trains were recently supplied to the London Transport Executive—one train from each of three firms—for trial purposes. These trains were of steel construction, but with

open a new era on British Railways and which, by providing fast and efficient inter-city services and by introducing all that is most up-to-date in railway travel, should help to bring back to the railways of the United Kingdom some of the traffic which has been lost to alternative means of transport. At the same time other firms have been awarded contracts for modern types of catering vehicles.

## Municipal Operation

### HAS M.P.T.A. TOO MANY COMMITTEES?

IN his presidential address to the annual conference of the Municipal Passenger Transport Association which opened in Blackpool on September 9, Alderman J. H. Whitaker, vice-chairman, Todmorden Joint Omnibus Committee, said that being municipal operators he took it for granted that they had great confidence in their ability to own, manage and run passenger transport as efficiently as any other form of ownership and control could do. Other things being equal it was obvious that municipal ownership and control could always beat the alternative methods of control and ownership to the extent of the difference between the interest on the capital employed paid by the alternative methods of ownership and the interest paid on the capital employed by the corporations in financing their undertakings. He laid it down as a basic and fundamental principle that it was the object and the aim of municipal ownership and control to provide an adequate and satisfactory, an efficient and sufficient service at the lowest possible price consistent with sound finance and that it was the accepted axiom that the rider should pay for his ride. "I do not agree that municipal undertakings have a right to look to the general rate fund in order to help them to run their passenger transport services."

There was, of course, no magic in municipal ownership any more than there was in company ownership or private ownership. The efficiency with which the system was applied was of far greater importance than the system itself and he submitted that the economic conditions under which the system had to operate were of greater importance and exerted much more influence on the final results achieved than either the system of ownership and control or the efficiency with which the form of ownership and control was applied. It required far less skill to make big profits in favourable conditions of trade than to make small losses in unfavourable conditions of trade.

There was one item which had had their close attention during the year and that was the penal tax on fuel oil which they were bearing. It was not sufficiently understood, at any rate by those outside their industry, what a colossal and intolerable burden this was. They had made representations along with other operating bodies to the Minister concerned but so far the efforts had not met with the success which the evidence submitted warranted.

"Is it realised that more than two-thirds of the price we pay for fuel oil is tax? Would any fair-minded Chancellor of the Exchequer place such a heavy burden on the raw material of an industry? If a bus is running 32,000 miles a year that bus pays in fuel oil tax £400, and what do we get for it? Very little indeed."

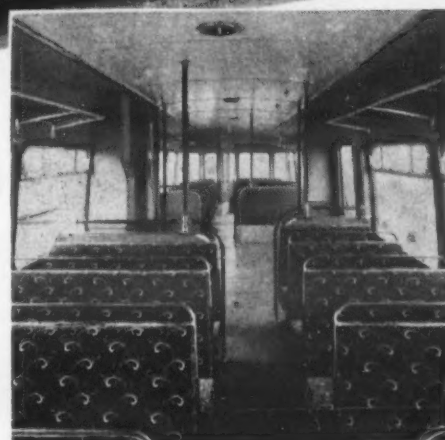
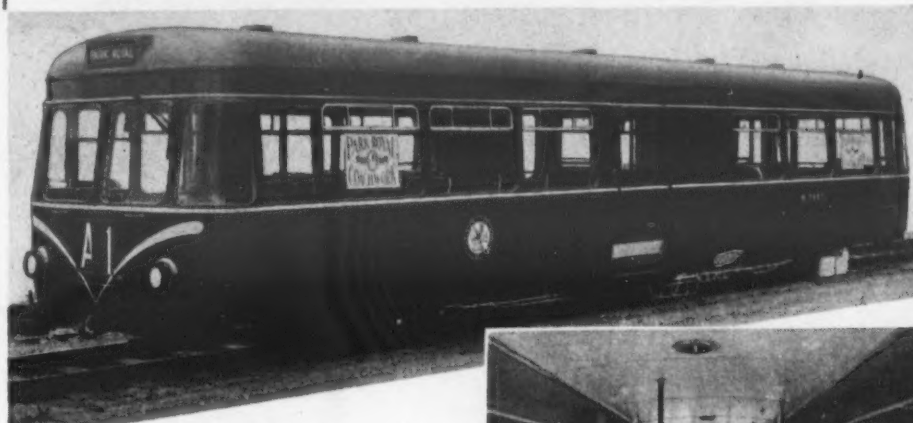
#### Too Many Committees?

There were many problems facing them to which it would be difficult to obtain a satisfactory solution. The activities of the association were wide and very varied and Alderman Whitaker could not help but think sometimes that if they had fewer activities and got closer up to the problems they were facing by devoting more time to them they would be spending their time more usefully. It was easy indeed to set up a committee but difficult indeed to wind up and abolish a committee. Once established a diligent search was made for something to inquire into and thus provide an excuse for continuing the committee in existence. Some of the redundant committees might with advantage be wound up, and thus relieve the secretary and his staff of some of their duties. Large committees wasted an awful amount of time and energy and there was much to be said for small committees with power to act. There were 11 standing committees of the Municipal Passenger Transport Association and it was represented on about 26 other committees of all sorts and sizes.

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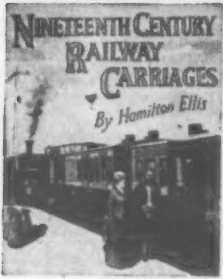
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## French Railways Compiègne in Service

THE new French Railways cross-Channel car ferry, the m.v. *Compiègne*, now in service between Dover and Calais, is the first ship of her type to be built in France. The Société des Chantiers Réunis Loire-Normandie was entrusted with her design and construction and she was built in its Grand-Quevilly shipyard at Rouen. With a capacity of up to 164 cars the new ship increased by more than 50 per cent the number of car spaces hitherto available daily on the railway cross-Channel car ferries during the summer season. She will also be able to operate between Dover and Boulogne during the winter, in pool with the British Railways car ferries.

The principal particulars of the new vessel are as follows:

Length overall	377 ft.
Length between perpendiculars	358 ft.
Maximum overall width (with fenders)	60 ft. 4 in.
Depth to promenade deck	34 ft. 5 in.
Mean draught	13 ft. 1 in.
Deadweight	641 tons
Estimated gross tonnage	3,400 tons
Speed attained during trials	Over 21 knots
Service speed	20 knots

She has three decks for cars, which are driven on to the lower deck aft. This is 12 ft. 6 in. high and therefore able to accommodate large motor coaches. The two other decks, each 7 ft. 4½ in.

open air when the weather is fine. In the furnishing of the passenger accommodation extensive use has been made of such materials as formica, aluminium and glass, all designed to give an impression of light and space, although the decoration generally is quite simple.

The vessel is propelled by two V-16 cylinder Pielstick supercharged diesel engines, built by the Société Générale de Constructions Mécaniques La Courneuve, under licence from the Société des Etudes de Moteurs Thermiques. Each engine is rated at 4,500 h.p. at 345 r.p.m. and has direct drive on to the propeller shaft. The propellers are of the Kameva reversible type. The captain controls directly from the bridge both the pitch of the propellers and the speed of the engines without any action being necessary on the part of the engine-room staff. Electric power is provided by three Gramme 280 kVA alternators delivering 50-cycle three-phase current at 380 volts and driven by engines built by the Société Générale de Constructions Mécaniques.

## Manoeuvrability

*Compiègne* is equipped, like most cross-Channel vessels, with both stern and bow rudders. In addition there are in the bows, under the water



The stern door of "Compiègne" just starting to close and, right, the door closed and bolted

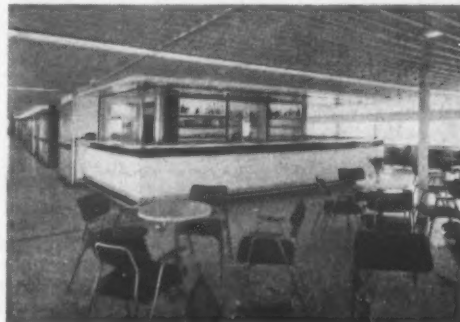
high, are both located forward. Access to the upper is provided by interior ramps. The movement of cars is one-way only and the first on are therefore the first off. The ventilation of the car decks has received special attention; the exhaust gases are drawn off by air suction pumps and fresh air is blown in.

## Central Control Point

The embarkation door was designed and constructed by the Société MacGregor-Comarain. It is composed of two jointed panels, folding upwards to a horizontal position. A hydraulic jack in the interior of the panels controls the opening and shutting. Hydraulic power also controls the locking of the doors in the open or shut positions. The hydraulic circuit has been designed in such a way that the unbolting from one position, the opening or closing, and the bolting of the door in the other position can be effected in succession from a single control point. Oil is supplied under pressure by an electro-hydraulic group situated

line, transversal tunnels in which the propulsion system makes it possible to exert a transversal thrust to port or starboard similar to that obtained with a tug, thus facilitating handling when coming alongside or casting off. The vessel is equipped with the usual steering gear forward and also a separate gear aft for steering her when proceeding astern in port. Radar equipment is provided at each position, the one aft being of a special high-definition type making it possible to sight near objects. The Decca 212 equipment is employed.

The ship has been making up to three crossings in each direction daily during the summer as traffic has required. Its introduction on the short sea routes was made necessary by the phenomenal and sustained increase in the numbers of motorists taking their cars to the Continent, as the following figures instance: 1938, 50,000 cars; 1955, 198,000; and 1957, 231,000. It became obvious several years ago that the existing vessels, the converted passenger steamer *Dinard*, which entered service in her present form in 1947, and the newly



The bar on the promenade deck; right, the bar lounge. Below: the upper and lower forward car decks and, right, the aft car deck

near the door. The engine output is 10 h.p. and the pump's constant discharge rate is 14 litres per minute.

The safety precautions against fire—especially important on a ship of this type—are claimed to be the most complete so far installed on a passenger vessel and to be the first to comply with the London Convention No. 1 specification for precautions against fire. On the car decks metal fireproof curtains can shut off three sections one from the other; rows of powerful water sprinklers provide additional fire barriers, and numerous foam hydrants can operate instantaneously. The lifeboats are made of a British fireproof plastics which is also shock resisting to a remarkable degree. New methods have also been employed in the construction of the passenger accommodation, which is of one class only, the floors, ceilings and walls of which are all made of fireproof materials.

## Passenger Accommodation

Accommodation has been provided on the *Compiègne* for 1,000 passengers. There is on the promenade deck a large lounge with bar, two wide promenades and a dining saloon seating 132; on the boat deck are a lounge giving a panoramic view over the bows of the ship, and a snack-bar with a daylight ceiling. There is also a sun-deck on which passengers can make the crossing in the

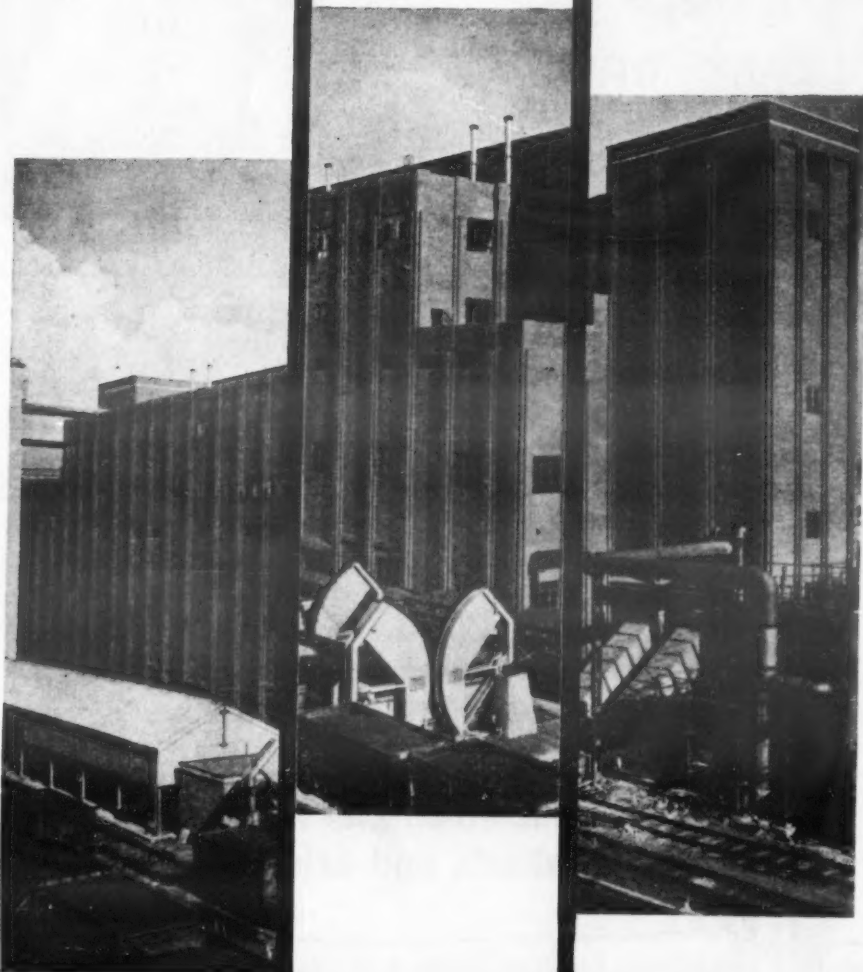
constructed *Lord Warden*, introduced in 1952, together with the Dover-Dunkerque train ferries, would not be sufficient to cope with the traffic if its upward trend continued even at the same rate.

## Success of Car Sleepers

French Railways, which, together with its predecessors has for almost a 100 years been associated with British Railways and its forerunners in dealing with cross-Channel traffic, felt that it must play its part in dealing with this problem, and, therefore, in 1956 placed the order for *Compiègne*. Another step to meet the demands of car traffic was the introduction last year of the Boulogne-Lyon Car Sleeper Express whereon passengers travel by wagon-lit or couchette sleeping berths on the same train as their cars. This service was an undoubted success from the outset.

*Compiègne* is the eighth French Railways vessel in the combined British and French Railways fleet operating across the Channel, the others being the s.s. *Côte d'Azur* on the passenger service between Folkestone and Calais, the m.v. *Saint-Germain* on the train ferry service between Dover and Dunkerque, the s.s. *Listieux* and the s.s. *Arromanches* on the passenger service between Newhaven and Dieppe, and the motor vessels *Nantes*, *Rennes* and *Brest* on the cargo service between Newhaven and Dieppe.

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# GREAT NORTHERN SUBURBAN SERVICES

## Eastern Region Type 2 Diesels

THE first example of a new type of Bo-Bo diesel locomotive has been delivered recently to the Eastern Region for use by the Great Northern Line. It is a Type 2 diesel-electric locomotive rated at 1,160 h.p. and built by the Birmingham Railway Carriage and Wagon Co., Limited, at Smethwick, Staffs.

### Power Plant

The diesel engine is a six-cylinder Sulzer engine manufactured by Vickers Armstrong at Barrow-in-

a 1,200-ton train of loose-coupled mineral wagons at an average speed of more than 30 m.p.h. over a distance of 86 miles.

### For G.N. Suburban Service

The locomotive has been designed and constructed to the requirements of the British Transport Commission under the overall direction of Messrs. R. C. Bond and S. B. Warder (chief mechanical engineer and chief electrical engineer respectively of the British Railways Central Staff,



Eastern Region 1,160-h.p. diesel locomotive by Birmingham Railway Carriage and Wagon Company, with Sulzer-Crompton Parkinson power plant, at Hornsey motive power depot, Great Northern Line, on which the Hertford North suburban service will be hauled by diesel-electric locomotives from early in 1959 onwards

### LEADING PARTICULARS OF D5300 CLASS

Wheel arrangement .. .. .	Bo-Bo	Water capacity for boiler .. .. .	600 gal.
Maximum permitted speed .. .. .	75 m.p.h.	Length over buffers .. .. .	50 ft. 9 in.
Maximum tractive effort .. .. .	42,000 lb.	Overall width .. .. .	8 ft. 10 in.
Continuous rating tractive effort .. .. .	30,000 lb. at 11 m.p.h.	Overall height .. .. .	12 ft. 8 in.
Weight in working order .. .. .	77½ tons	Bogie wheelbase .. .. .	10 ft.
Fuel capacity—engine .. .. .	500 gal.	Bogie pivot centres .. .. .	29 ft.
Fuel capacity—boiler .. .. .	100 gal.	Wheel diameter .. .. .	3 ft. 7 in.

Furness; it develops 1,160 h.p. at 750 r.p.m. The cylinder size is 11.02 in. bore by 14.17 in. stroke. Control of the diesel engine is effected by electro-pneumatic means with a continuous torque control available over the whole range of engine speed. The electrical equipment consists of a main generator by Crompton Parkinson, of Chelmsford, which has a continuous rating of 800 volts, 950 amps, at 750 r.p.m. The four traction motors are also provided by Crompton Parkinson. Control gear is by Allen West of Brighton.

### Roomy Cabs

The driving cabs at each end are roomy and the arrangement of the controls provides for great comfort for the driver and good visibility. Fitted to the driver's window is demisting equipment similar to that fitted to the Comet aircraft. During preliminary tests the locomotive hauled a twelve-coach train at speeds of up to 75 m.p.h. and also hauled

B.T.C.). As the locomotives will go into service in the Eastern Region, that region therefore became the sponsor region for collaboration and inspection during the execution of the contract, under the direction of Mr. K. J. Cook, chief mechanical and electrical engineer, Eastern Region.

The order now beginning delivery is for 20 of these locomotives for use on the Great Northern Line on trains between Kings Cross and Hitchin and Hertford; they will be used in replacement of steam locomotives of the well-known Great Northern Railway 0-6-2 tank type pending electrification. Their use should enable a new timetable to be introduced over the Hertford North branch in spring, 1959 (by which time it is hoped deliveries of the new locomotives will be complete), giving a service of increased speed and frequency. The first of these locomotives to be received is already in use in the suburban area to enable crews to be trained in diesel driving.

## Level-Ride Seat

### NEW CHAPMAN RUBBER-SUSPENDED UNIT

GREATER comfort and more-certain vehicle control over rough surfaces appear assured to users of a new rubber-suspended driver's seat developed by A. W. Chapman, Limited, Ranelagh Gardens, London, S.W.6, in collaboration with the Bostrom Company, of Milwaukee, U.S.A. A. W. Chapman, Limited, has gained a high reputation for its interest in driver comfort and its products under the Leveroll and other trade marks are extensively used in the road vehicle and railway industries. The new seat is the result of several years' research and experi-

proved that an almost unbearable jolting in a standard seat was reduced to a practically imperceptible level by the new mechanism.

### Rubber Torsion Springs

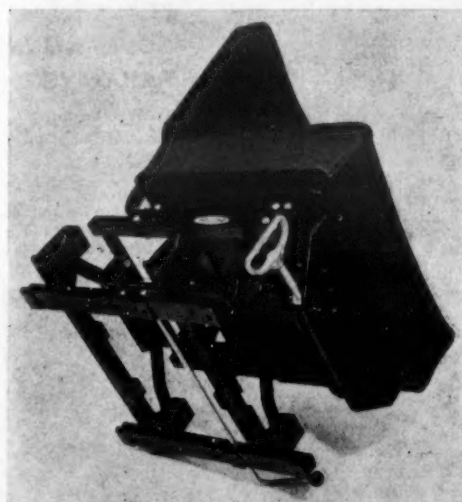
The Level-Ride mechanism comprises a system of levers and linkages suspended on two Metalastik rubber torsion springs, the resilience of which is adjustable over a wide range from the seated position to cater for differences in drivers' weights and the nature of the going. A normal Leveroll double-locking fore-and-aft adjustment is provided and although no separate vertical adjustment is fitted in the standard arrangement, a system to provide this facility is now being designed and will be available. A damper for the seat suspension to absorb excessive shocks which might be experienced in off-road vehicles on particularly rough going has already been developed and is available as an optional fitting.

Examples of the Level-Ride seat suspension designed for use on goods vehicles are now available from the Chapman company to manufacturers and operators at a nominal price so that tests can be carried out under service conditions. A comfortable tubular-framed seat with adjustable backrest has been designed for use with the new suspension, although any of the company's standard range of seats can be fitted. The vibrating table on which the remarkable flexibility of the system can be compared with that of a normal seat is available at the Chapman works for demonstration to interested parties, and will also be on the company's stand at the Commercial Motor Show.

The new seat will be of the greatest value in vehicles designed mainly for off-road and overseas use, as our recent experience in driving under such conditions is that modern vehicles will withstand the effects of continuous heavy shocks better than the drivers. But there is also room for its use in some types of heavy commercial vehicles for road use, where the unladen ride can often be anything but smooth and driving long distances without load can produce driver fatigue and have a bearing on road safety.

Production was not affected and no one was hurt when fire broke out on August 12 in a storage building at the Goodyear Tyre and Rubber Company's factory at Bushbury, Wolverhampton. The outbreak was confined to the building which houses lockers and is primarily used for the storage of old tyre bags.

A new iron powder electrode name Ferrolux has been introduced for the welding of mild steel by Quasi-Arc, Limited. It is designed for high-speed welding in the flat and horizontal-vertical positions, can be used with a.c. or d.c. welding equipment and is of particular value on production work where high output and good weld profile is required.



The new Chapman Level-Ride seat tilted to show the adjustable rubber torsion springs

ment that have taken account of all the factors which might affect safe control under difficult conditions and which might be conducive to driver fatigue.

### Research Findings

Research has shown that at low frequencies of the order of 1 to 1½ cycles a second, the human body can stand vibrations of a fairly high amplitude without great discomfort or any danger to health but at frequencies higher than these the onset of discomfort occurs at much lower amplitudes. The natural frequency or rate of oscillation of lorries has been found to lie between 2 and 5 c.p.s. so that amplitude must be kept low if a comfortable ride is to be provided. The Leveroll Level-Ride seat is claimed to reduce a 3-c.p.s. oscillation of ¼-in. amplitude to an amplitude of only ⅛ in. and a demonstration we saw last week using a vibrating table certainly



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## TYRES, WHEELS, AXLES, SPRINGS, FORGINGS

The use of tyres on electric and diesel locomotives and in passenger stock will still continue, in accordance with British Railways' plans. Steel, Peech & Tozer are one of the principal suppliers of these tyres, which they have been manufacturing for nearly 70 years. More arduous modern operating conditions call for tyres made from special quality steels: Steel, Peech & Tozer are supplying these in increasing quantities.



SP 207



Brush Traction delivered the first of 20 1,250 H.P. (A1A-A1A) Main Line Diesel Electric Locomotives 5 weeks ahead of schedule - the 15th has been handed over 8 weeks ahead ...

B.T.C. orders **BRUSH** again



Brush Traction have now received from the British Transport Commission an order for a further 40 similar Main Line Diesel Electric Locomotives, as part of their recently accelerated programme of partial conversion to diesel traction. Each locomotive will be completely fitted out with Brush Traction equipment, and delivery - will commence early 1959.



BRUSH TRACTION DIVISION

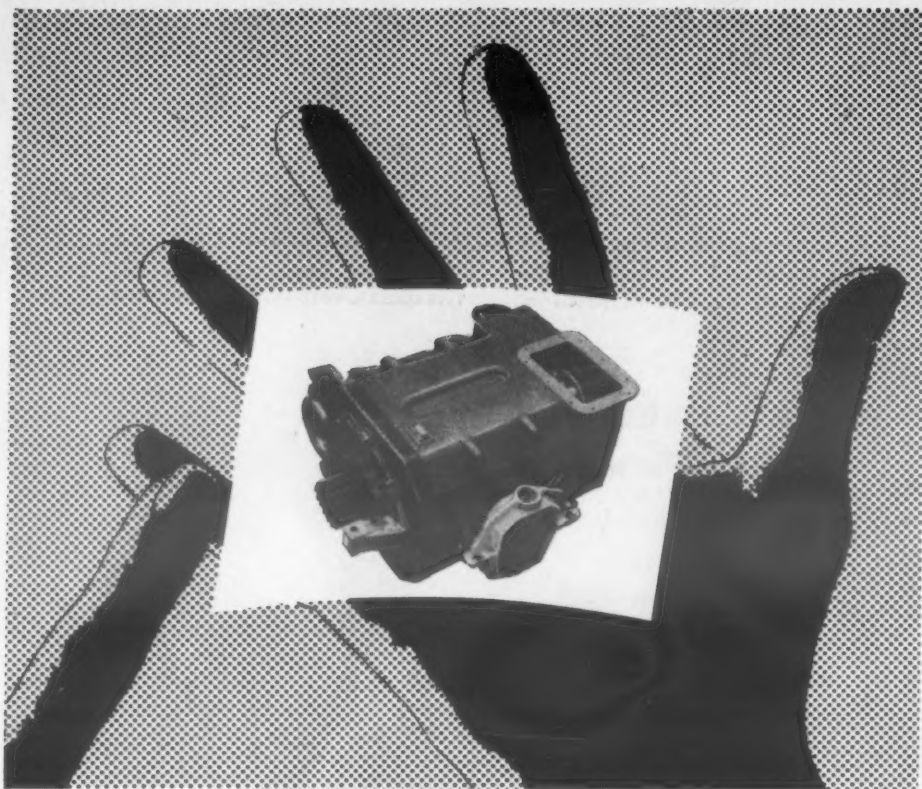
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B.T.S.





## 4 regions . . . 1 motor

Crompton Parkinson are building the electrical equipment for 93 new main line diesel locomotives: forty-five of 1550 h.p. for the Southern Region; twenty of 1160 h.p. for the Eastern and North Eastern Region; eighteen of 1160 h.p. for the Scottish Region; and ten of 2300 h.p. for the London Midland Region. To make possible economies in future maintenance and the supply of spares, one design

of traction motor is used throughout these various contracts; four per locomotive up to 1550 h.p., with six of each for the 2300 h.p. locomotives. The motors, C.P. type C.171, are forced ventilated, and have a bonded-rubber nose suspension. They have been specially designed for diesel-electric duties and are particularly easy to maintain.

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## SIGNALLING AND BRAKE MANUFACTURE

One Hundred Years of British Pioneering and Development

By MERVYN W. SHORTER, M.I.R.S.E., M.Inst.T.,  
Managing Director, Westinghouse Brake and Signal Co. Limited

OVER more than a hundred years specialised sections of British industry have been engaged in meeting the needs of railways in all parts of the world. The needs are constantly changing, developing, and becoming ever more severe, so that the railway supply industry in all its ramifications has, over this long period, had to be geared to a degree of flexibility in outlook and versatility in production. In no section of the industry is the process of change and development more marked than in brake equipment and signalling; but, in its task as a century-old exporter of railway "know-how" the industry with which I am particularly connected has constantly in mind the great traditions of railway safety synonymous with

block signalling and interlocking, which was carried out on the railways of this country to a degree of completeness equalled nowhere else in the world. British-made interlocking frames, of whatever manufacturer's design, became accepted without any question as inherently safe and dependable machines for the control of railway traffic.

Similarly, the gradual development of the practice of semaphore signalling and the presentation of a clear and unmistakable indication to the driver was furthered to no small extent by the mounting fund of experience on which the signal manufacturers were able to base their products. It is of course true that, at this early stage in the history of signalling, not all new ideas came from the manufacturers; but the suggestion of the centre-balanced semaphore arm, sometimes referred



A Euston-Watford electric set with electro-pneumatic brakes on the London Midland Region of British Railways

travel on the home railways of Great Britain, yet never allowing tradition in this respect to cramp the style of the most modern developments, or to delay the adoption of the latest scientific and manufacturing techniques.

### Rapid Signalling Development

Taking railway signalling first as the older of these two branches of the industry, the early competitive days during the 60s, 70s, and 80s of last century produced a flood of inventions in the field of interlocking apparatus, and devices for the protection of facing points. The intense rivalry between the various different firms manufacturing the apparatus resulted in a rapid stream of development, both in ideas and in manufacturing technique, that was of great benefit to the railways in the gradual perfecting of the system of manual

to as the somersault signal, following the Abbots Ripton collision on the Great Northern Railway in 1876, was taken up very strongly by one of the constituents of my own company, McKenzie and Holland, Limited, and centre-balanced arms were manufactured at Worcester in large quantities for export as well as for service on many of the important local railways in Wales.

### Heavy Suburban Traffic

When the density of traffic began to grow to the extent of becoming an embarrassment at busy junctions, the idea of providing some interlock between the position of the signals and points on the one hand, and the actual movement of trains on the other was developed by Mr. W. R. Sykes, and the system of "lock and block" was worked out by the firm of which he was the founder, the

(Continued on page 23)



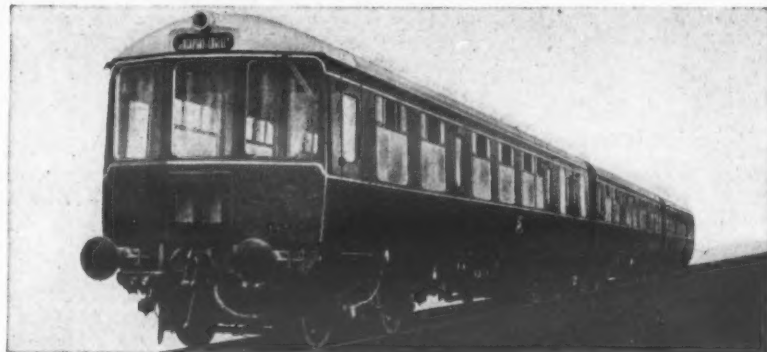
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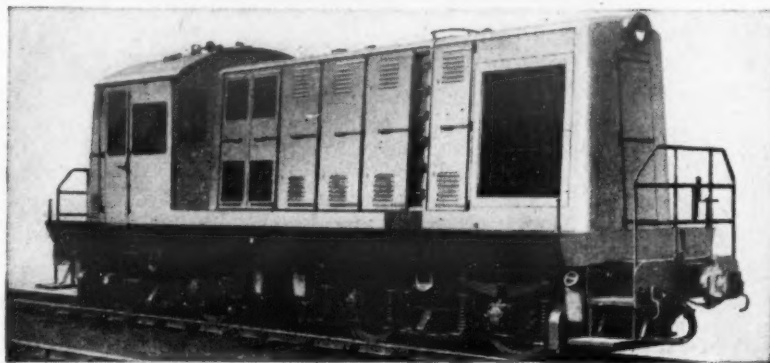
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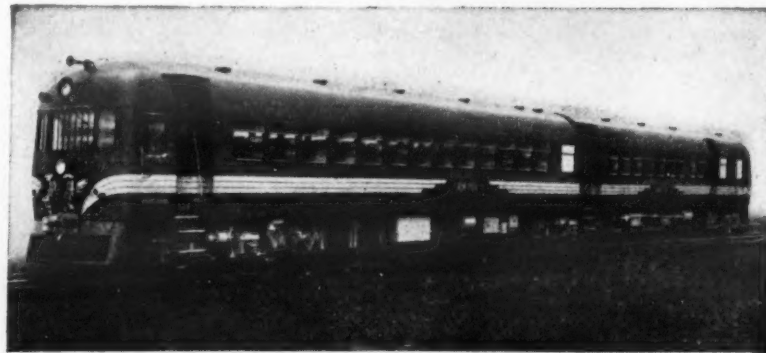
400 h.p. Diesel  
Electric  
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### NEW ZEALAND GOVERNMENT RAILWAYS

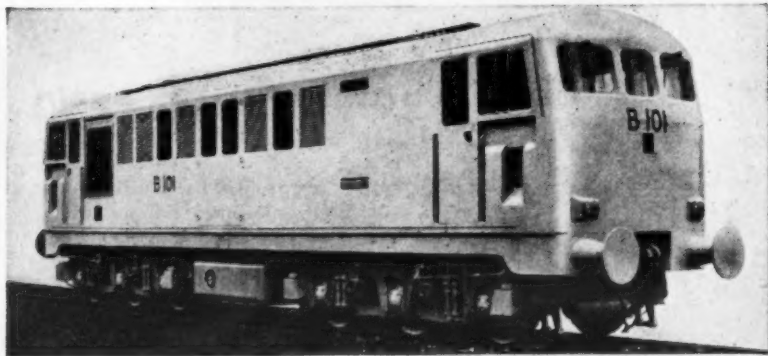
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Railcars

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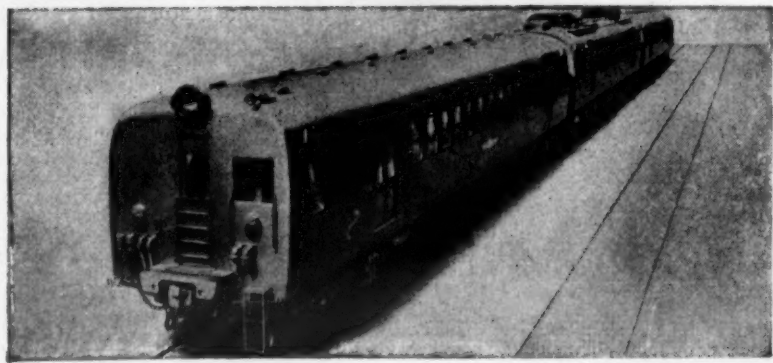
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W. R. Sykes Interlocking Signal Company. This concern devised and supplied interlocking apparatus for some of the heaviest worked suburban railway systems to be found anywhere in the world—in particular, the London suburban lines of the Great Eastern, London, Brighton, and South Coast, and the South Eastern and Chatham Railways.

The rapid development of mechanical signalling practice in Great Britain and its effectiveness in reducing to a minimum the number of fatal accidents on a railway system that was, even in the last decades of the 19th century, by far and away the busiest to be found anywhere in the world, led to the adoption, in some measure, of British methods of signalling abroad and the signal manufacturers of Great Britain were called upon to advise, to prepare schemes, and also to supply equipment and the installation staff. At the same time, in parts of the world where traffic did not warrant such complete signalling, interlocking and block working as in Great Britain, engineers of the British signalling firms, in conjunction with railway officers abroad, devised simpler methods whereby the inherent safety practice of British Railways could be applied to the extent that the particular requirements justified. It was not a case of exporting a standard product. Locking frames, ground gear, and control apparatus were modified, adapted, and in many cases greatly simplified, to meet the needs of the overseas market. This business had a two-fold advantage, in that manufacturing experience for overseas increased the "know-how" of the contractors and in certain cases enabled them to turn their added experience to the advantage of products hitherto exclusively manufactured for the home railways.



Modern signal equipment and the new signalbox recently installed at London St. Pancras

most important factors in railway operation today is the need to secure the best possible regulation of traffic along the lines, and to this end it is desirable to bring the largest possible area under the control of one signal box. In consequence, at a number of interlockings where modern power signalling is being installed, the control area is being extended to include considerable lengths of the approach lines and outlying junctions so as to give signalmen the most comprehensive "picture" of railway operating in their immediate area. Hitherto one of the difficulties in the accomplishment of such work has been the cost of cable for providing the necessary control and indication of all the outlying functions.

#### C.T.C.

The adoption of the coded remote control system, generally known as C.T.C., has not been practicable on busy lines, as insufficient time would be available for the various control and indication codes to be sent; but in recent years the application of electronic methods has entirely altered the picture, and installations are now being made of apparatus capable of handling 30 control codes, and 60 indication codes, per second. With such rapid means of control, needing only two line wires, the extent of an interlocking is now no longer constrained by distance. The combination of relay interlocking with electronic remote control for outlying sections, as developed by British manufacturers, is providing one of the most compact and efficient means of railway signalling that has ever yet been devised.

#### Brakes

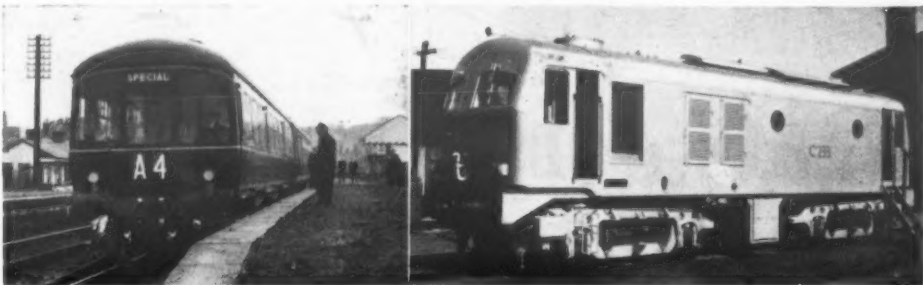
Turning now to brakes, the stormy period during the eighties and nineties of last century, when the "Battle of the Brakes" was being fought out on the railways of Great Britain, can be passed over briefly. It was as much a fight for automatic continuous brakes, versus several non-automatic versions, as between the air and vacuum brakes. It is enough to say, in retrospect, that the efforts of the brake manufacturers made railways all over the world "brake conscious," to an extent perhaps that they had never been before. Preference for the vacuum brake on many of the largest British railways naturally led to its adoption in many overseas countries where British railway interests and enterprise were strong, and to meet the increasingly severe conditions of service much has been done by the manufacturers to improve the performance of the brake itself, and to keep individual items of equipment up to the latest requirements in respect of ease in maintenance, lightness in construction, and so on.

There has been, for example, continuous development in the design of ejectors. Gresham and Craven have manufactured the Dreadnought, Super Dreadnought, S.J., S.J.R., and S.S.R. ejectors, which are known throughout the world equally with the Davis and Metcalfe combination ejector. All these types may incorporate a steam brake valve, great improvements in which have been effected by Gresham and Craven, and the latest type of graduable and automatic steam brake valve has been widely installed. The use of pressed steel vacuum brake cylinders on locomotives, carriages, and wagons has effected a notable

#### Power Signalling

The first applications of power to railway signalling were not made in this country, and although some large and important installations were completed on British railways between 1898 and 1908, power signalling did not make immediate headway generally, due to the very completeness of the signalling and interlocking arrangements already in service. The use of electrical apparatus on an extensive scale first took the form of auxiliary equipment providing additional safeguards and facilities to the established mechanical practice, but after the conclusion of the 1914-18 war British practice went rapidly ahead and some notable developments pioneered by the signalling manufacturers in Great Britain were made in the last 10 years before the 1939-45 war.

Of these special mention must be made of the first power interlocking frame to have the interlocking between levers accomplished electrically. In this way the mechanical mechanism hitherto always employed was dispensed with, and with it the need for extreme precision in manufacture and erection in order to get the mechanical mechanism to work sweetly. Furthermore, it was no longer essential for all the levers to be in one straight line. The first locking frame of this kind was installed on the Southern Railway at North Kent East Junction in 1929. It was designed and built by the Westinghouse Brake and Signal Company. From the elimination of the mechanical locking between levers, it was a logical step to the elimina-



A Park Royal railcar fitted with the Gresham and Craven quick-release vacuum brake and (right) the Coras Iompair Eireann diesel-electric locomotives built by Metropolitan-Vickers with Metropolitan-Cammell mechanical parts have Gresham and Craven vacuum brake gear, these being of the augmented type for the Co-Co express locomotives

tion of the lock lever entirely, and the accomplishment of all the interlocking through the agency of relays. This made possible very much smaller and more compact control machines, and British manufacturers, working in close co-operation with engineers of the British home railways, developed several systems of relay interlocking. Among these was the "entrance-exit" system, of which the first in the world was installed at Brunswick near Liverpool, Cheshire Lines, in 1937. The control system here installed was the Metropolitan Vickers-G.R.S. "N.X." type.

#### Large Interlockings

At this stage in signalling development, British manufacturers were leading the world in size and complexity of interlockings in which the actual interlocking itself was accomplished by relays, and the large plant installed on the L.N.E.R. at Leeds in 1936, at Hull in 1938, and Northallerton in 1939 were, by a considerable margin, the largest relay interlockings that had been put into commission anywhere at that date.

During the period of the second world war progress so far as installations were concerned was naturally retarded, although a great deal of development work was carried out, and the conclusion of the war saw also the completion of some notable projects for which contracts had been awarded prior to September, 1939, such as the relay interlockings at Doncaster (Standard Telephones and Cables), sequence switch systems, Liverpool Street (Siemens and General Electric Railway Signal Company), Stratford (Metropolitan-Vickers-G.R.S.), and the largest single installation of power signalling to be found anywhere in the world, that at York (Westinghouse Brake and Signal) on the O.C.S. system, completed in 1951.

#### Modernisation

The British Railways modernisation plan is being accompanied by many notable installations of new signalling, many following in principle on the lines of previous development; but one of the

reduction in weight; hose coupling heads in die-cast aluminium have been introduced, while the use of quick service application valves of various types has made possible shorter stopping distances.

#### Improving the Vacuum Type

One disadvantage of the original form of the automatic vacuum brake was the relatively low overall rate of retardation possible, due to the time taken to propagate the reduction in vacuum made by the application of the driver's brake valve throughout the length of the train. Tests have shown that there is often an interval of 20 seconds between the time of full application of the brakes at the front and rear of a 12-car train. The development of the Westinghouse quick service application valve has made possible a greatly improved performance, and on the same 12-car train as referred to above the time interval between front and rear application was reduced to 2½ seconds. The use of quick service application valves has, indeed, made possible stopping times and distances with the vacuum brake approximately equal to those of the automatic air brake, and a further improvement has been obtained by the introduction of electric control, widely used by the South African Railways for suburban services.

#### Electro-Pneumatic Brake

It is, however, in the matter of release times that the vacuum brake, with all its modern improvements, cannot compete with the air brake. Release times are of the utmost importance in the operation of an intense electrically hauled suburban service, where station stops are measured in seconds rather than minutes, and on the great majority of such lines both in this country and overseas, the air brake has been used from the outset, even on railways using the vacuum brake for the remainder of their services. The fact of the suburban stock being of the multiple-unit type and non-interchangeable has obviated any difficulties that might have arisen due to non-standard

(Continued on page 25)

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## Signals and Brakes

(Continued from page 23)

brakes, with the consequent need for dual fitting. Between the two world wars the Westinghouse Brake and Signal Company carried out an important development of the air brake with particular reference to the needs of intense suburban service. The electro-pneumatic control is a system which is entirely a British development, and has been more widely applied and still further developed since 1945. It eliminates the time lag between application at the front and rear of a train and has reduced release times to a minimum. In conjunction with electro-pneumatic control, the development of the self-lapping brake valve has simplified the operation of the brake from the driver's point of view, and assisted in the regular accomplishment of those niceties of control that are so desirable when making a rapid stop, in the avoidance of all jerk and snatch. The E.P. brake lends itself readily to methods of automatic retardation control, where these are considered necessary.

On the electrified railways of London Transport, the most intense passenger service to be found anywhere in the world, all trains are equipped with the E.P. brake. Another world record holder, the Southern Region of British Railways which operates the largest suburban electrified system, adopted the air brake from the outset, and at the present time all new stock, both for the inner suburban sections, and for the longer-distance extensions, is fitted with the electro-pneumatic brake. The latest addition is the electrification of the Kent Coast line from Chatham to Ramsgate and Margate and all the associated secondary lines, including one to Dover, for which rolling stock is now being built. Among other notable

services on which the E.P. brake is used are the Bombay and Calcutta electrifications, Melbourne and Sydney suburban services, the Manchester-Glossop route (L.M. Region, British Railways), the Liverpool Street to Shenfield and Southend electrification (British Railways, Eastern Region), and in Canada, the Toronto Subway.

### Multiple-Unit Diesel Railcars

The introduction of multiple-unit diesel railcar sets on many parts of British Railways has led to the development of a system for quick release of the vacuum brake by Gresham and Craven. This system has been developed specially for use on units where the vacuum exhaustor is mechanically driven from the main diesel engine, and therefore the exhaustor will be operating at a minimum speed and capacity when the car is standing in a station and exhaustor capacity is not available for the rapid release of the brakes. The Gresham and Craven A.I.V. system has been devised so that release of the brakes is independent of the exhaustor speed, and is obtained by means of a separate release chamber which is charged to a high degree of vacuum while the car is running.

Many other improvements, both in detail and principle have been pioneered by British manufacturers of brake and signalling equipment, but the examples quoted in this article are only to show that British manufacturers are not merely keeping abreast of the requirements of the day, but are by their constant development work, both in signalling and in braking, making available to railway administrations techniques that enable greatly improved methods of braking control and train running to be realised.

## Spanish Railway Modernisation

(Continued from page 3)

some special types of hoppers and tankers as well as the general utility types, and the continuance of the power braking programme already begun. The majority of goods trains will be fitted with automatic vacuum brakes, bringing economies in staff and greater safety. In the passenger services there will be much improvement in its modernisation by the acquisition of new coaches and larger vans, and especially by the introduction of TALGO trains in the long-distance day services, and light trains for local services.

It is natural that the introduction of so much modern rolling stock, the consequent and complicated upkeep will require an improvement in all facilities for repairs, and to cope with this improvements will be introduced at certain depots, in stocks of spares, and repair facilities.

### Proposed Building Programme

With these things in mind the following acquisitions and works are proposed:

#### Locomotives:

- 50 diesel-electric locomotives
- 162 diesel-electric shunting locomotives
- 70 four-wheeled shunting tractors
- Spares for locomotives
- Oil-firing plant for 100 locomotives

#### Light Express and TALGO Trains:

- 10 self-propelled trains
- 30 light self-propelled trains
- 11 TALGO trains
- 15 diesel locomotives for TALGO service

#### Rolling Stock:

- 100 eight-wheeled metal coaches
- 30 eight-wheeled metal vans
- 50 four-wheeled metal vans
- 50 bogie tank wagons
- 600 hoppers for iron ore
- 10,000 four-wheeled wagons of various types, including hoppers for ballast
- Braking equipment for 500 wagons, and improved braking for 7,000 wagons
- 120 sets of bogies for metal coaches
- Axles, special bogies and lighting equipment for coaches, and other materials

#### Workshops, Depots, Stores and Offices:

- Installation of fuel oil or diesel oil supplies at various depots
- Improvement of the locomotive shops at Madrid (A)
- Changeover of depot at Orense to diesel traction
- Changeover of various other depots to diesel power
- Completion of rationalised depots (Salamanca, Valencia, Monforte and Sevilla)
- Enlargement of diesel fuel storage at Aravaca, Zaragoza and Murcia
- Improvement of various signalboxes

### Communications

The complete reconstruction of telephone lines is provided for on the sections Madrid-Zaragoza (341 km.) and Madrid-Avila (121 km.), and simple improvements, including the addition of a circuit on the Sevilla-Huelva, Monforte-La Coruña, Ciudad Real-Mérida, Zamora-Salamanca, Utrera-Bobadilla and Baeza-Morela lines, with the branch joining P. Pío-Atocha-Delicias in Madrid, making an extension of 898 km. Automatic telephone exchanges are to be provided for the stations at Valencia and León.

Selective telephones are suggested for 92 points in the sections Sevilla-Huelva, Zuera-Canfranc, Baeza-Morela, Zamora-Salamanca, Torralba-Soria, Salamanca-Fuentes de Oñoro, Monforte-La Coruña, and Ciudad Real-Mérida: teleprinter apparatus for communications between classified stations, important points in the network, and zone headquarters; and 30 high-frequency sets for a telephone network and long-distance telegraph. To achieve communication between trains in motion and control points in the three principal arteries (Madrid to Irún, to Sevilla and to Barcelona) and in the sections Valencia-Tarragona, Venta de Baños-Gijón and Córdoba-Algeciras, 94 fixed radio sets will be installed over the routes and 46 mobile sets in the trains.

### Signalling

The most important installations or extensions to be carried out include centralised traffic control (C.T.C.) in the sections Ponferrada-Orense, Valencia-Castellón, Tortosa-Tarragona and Zaragoza-Zeus; automatic block over 183 km. (Moncada-Manresa, Bilbao-Portugalete, Mérida-Venta de Baños, Casetas-Zaragoza (S), Tarragona-San Vicente) and manual block over 202 km. and 23 stations. There will be electric telegraph block posts and 44 manual posts in double track, for remote control of trains at switches; installation of 40 mechanical frames on single track, with electric equipment; provision of colour-light signals in 40 stations on lines to be electrified (Avila-

Mérida, Venta de Baños-León, Zaragoza (S)-Mora, Madrid-Alcázar) and Port Bou station; automatic distant signals at 189 level crossings on the lines from Madrid to Hendaye, to Barcelona and to Sevilla, and from Valencia to Tarragona.

### Electrification

Electrification constitutes an indispensable improvement in our country, owing to the shortage of suitable fuels, and for this reason it is given fundamental importance. A plan for electrification has been set down in which the different lines are divided into four stages, according to urgency:

#### First Stage (first and second year)

##### Ponferrada-Monforte:

119 km. single track, the electrification of which is considered imperative to complete the Asturias-León and León-Ponferrada lines, as it involves a stretch of single track with a large number of tunnels, and regard being given to the big increase of development forecast in coal and mineral traffic.

##### Avila-Mérida:

86 km. double track or 172 km. single track.

##### Hontanares-Mérida:

79 km. single track.

The last two are complementary to the electrification of the Madrid-Avila-Segovia sector, and the first step in establishing direct communication between the mining valley of Asturias and the interior of the Peninsula.

#### Second Stage (third year)

##### Mérida-Venta de Baños:

79 km. double track or 158 km. of single track. Electrification considered indispensable owing to intensity of traffic. It will complete the Madrid-Mérida, via Avila and via Segovia, sector.

##### Mora-Zaragoza:

191 km. single track. Electrification deemed necessary as a complement to the Catalonia "S," and because it is a section with a large number of tunnels. It would assist, moreover, in continuing electrification on the Madrid-Barcelona line.

##### Empalme-Port Bou:

60 km. single track and 37 km. double track, or 134 km. single track. This line will complete electrification in Catalonia up to the French frontier.

#### Third Stage (fourth year)

##### Baides-Zaragoza:

158 km. single track and 60 km. double track or 278 km. single track. This electrification is the continuation of that of Mora-Zaragoza, prolonging it to Baides to avoid the division station and the present difficulties with steam traction there. To link up Barcelona with Madrid there is only the stretch from Baides to Madrid which, at the moment, it is not possible to electrify, due to inability to obtain delivery of the necessary train units, but it will be included in later plans.

##### Venta de Baños-León:

133 km. double track or 266 km. single track. This electrification completes the linking-up of the centre of Spain with Asturias and Galicia, giving an outlet to the long electrified lines from Madrid to Gijón and Monforte, and thus achieving a high utilisation of locomotive operation.

#### Fourth Stage (fifth year)

##### Palencia-Alar:

80 km. single track. This electrification is considered advantageous in order to link the two previous with the Alar-Santander line, permitting the maximum utilisation of the latter.

##### Madrid-Alcázar:

150 km. double track or 300 km. single track. This line will make a link between the electrified systems of the Centre with those of the South, and complete the Madrid-Córdoba line.

To summarise, it is proposed, under this plan, as can be seen from the map on page 3, almost to complete the electrification of the lines from the French frontier, across Catalonia and Zaragoza to Baides (to continue in due course to Madrid); Monforte, Gijón and Santander with Madrid, through Palencia and Venta de Baños; and those of Andalucía from Madrid to Córdoba. In all it represents the electrification of 1,232 km. of line, of which 545 km. are double track, that is to say a total of 1,777 km. of single track.

Air-pressure braking equipment, fitted as standard to the Leyland Atlantean double-deck bus chassis, which was described in our last issue, is by Westinghouse Brake and Signal Co., Limited. In the second paragraph of the article the overall heights of the two types of M.C.W. body developed for the Atlantean were wrongly quoted. The unladen heights are 14 ft. 4 in. for the normal height 78-seat bus and 13 ft. 4 in. for the low-height 73-seat bus, as shown elsewhere in the text and on the diagram.

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## IMPORTANT CONTRACTS

## First Rotodyne Ordered

THE first order for a Fairey Rotodyne vertical-take-off air liner, placed by a Canadian company, the Okanagan Helicopter Group, Vancouver, was announced by the Fairey Aviation Company at the S.B.A.C. Flying Display at Farnborough on September 4. Delivery will be in the next two to three years and the Rotodyne will be used by the group on passenger services between city centres in Canada. With a fleet of 54 helicopters, Okanagan is the largest commercial helicopter operator in the world, having logged 100,000 operational hours and carried 75,000 passengers and thousands of tons of freight during the past 10 years.

## Southern Region Contracts

The Southern Region of British Railways has placed the following contracts:

Meridian Airmaps, Limited, Shoreham Airport, for aerial survey of Steyning branch line.  
Leonard Fairclough, Limited, London, N.W.5, for reconstruction of bridge at Streatham.  
Carter-Horsley (Engineers), Limited, Waddon, for renewal of transverse bracing to trestles of Meldon Viaduct, Okehampton.  
George Wimpey and Co., Limited, Hayes, for soil survey at Redbridge Viaduct and Southampton Terminus.  
The Tees Side Bridge and Engineering Works, Limited, Middlesbrough, for structural steelwork for Victoria Eccleston Bridge.

## Scottish Region Contracts

The following contracts have been placed by the Scottish Region of British Railways:

P. and W. Anderson (Glasgow), Limited, Glasgow, for extension to chain repair shop, Cowairs Works, Glasgow.  
Edward Curran Engineering, Limited, Cardiff, for a wheel cleaning machine for Cowairs Works, Glasgow.  
The Lanarkshire Welding Co., Limited, Wishaw, for new steel superstructures for two bridges between Guthrie and Glasterlaw.  
Standard Telephones and Cables, Limited, London, for control telephone equipment on the Airdrie-Helensburgh line and branches and train describer apparatus for Glasgow Central signalling scheme.  
The Siemens and General Electric Railway Signal Co., Limited, Wembley, for colour-light signalling, Airdrie to Kelvinhaugh.

## Diesel Parcels Vans Ordered

The British Transport Commission has placed contracts with Ruston and Hornsby, Limited, Lincoln, for four 165-h.p. diesel-electric shunting locomotives and three 88-h.p. diesel-mechanical shunting locomotives, and with the Gloucester Railway Carriage and Wagon Co., Limited, for eight diesel parcel vans 63 ft. 6 in. in length. The shunting locomotives will be allocated to the civil engineers' depots of the Western and North Eastern regions. The parcel vans, which are powered by twin B.U.T. 230-h.p. engines and equipped with driving cabs at each end, will be used in areas of the London Midland and Western regions where diesel working is already being developed.

## More Diesels for S.R.

An order has been placed with the English Electric Co., Limited, by the Southern Region of British Railways for further complete 600-h.p. diesel-electric equipments which will be used in the region's manufacturing programme for the modernisation and expansion of passenger services in Hampshire. The order covers equipment for four motor coaches, four driving trailer coaches and 22 non-driving trailer coaches. The new coaches will be built at the railway works at

Eastleigh and Ashford and will meet the need to expand the successful South Hampshire diesel-electric services inaugurated last year as part of the modernisation plan.

## Switchgear for B.R. Electrification

The British Transport Commission has placed an order with South Wales Switchgear, Limited, for 266 sets of 6.25-kV switchgear equipment needed for electrification programmes Fenchurch Street to Tilbury and Southend; Liverpool Street to Enfield, Chingford, Hertford East and Bishops Stortford; and Liverpool Street to Chelmsford and Southend in the Eastern Region of British Railways.

## Decca Radar for Bristol Airport

The Decca Type 424 Mark II airfield control radar has been ordered for installation at the Bristol Corporation Airport at Lulsgate, which was opened to traffic just over a year ago after Whitchurch Airport was closed. Since its opening Lulsgate has handled a steadily increasing flow of scheduled traffic from Aer Lingus, Cambrian and other airlines. The Decca 424 is to be used for precision talk-down and local area surveillance and was chosen after extensive operational trials at Lulsgate.

## South Wales Docks Contracts

The South Wales Docks (British Transport Commission) has placed the following contracts:

Seawork, Limited, for two new twin-screw diesel-engined tugs for the South Wales ports.  
Demolition and Construction Co., Limited, for repairs to West Wharf, Prince of Wales Dock, Swansea.  
G. Percy Trentham, Limited, for repairs to wharf at No. 14 hoist, Kings Dock, Swansea.  
Carter-Horsley (Engineers), Limited, for renewal of sheeting and repairs to steelwork, D shed, Kings Dock, Swansea.  
Penarth Pontoon, Slipway and Shiprepairing Co., Limited, for general overhaul of s.d. *Pezzes*.  
Stelcon (Industrial Floors), Limited, for paving for three sections of South Quay, Newport.

## TENDERS INVITED

THE following items are extracted from the Board of Trade Special Register Service of Information. Inquiries should be addressed, quoting reference number where given, to the Export Services Branch, Board of Trade, Lacon House, Theobalds Road, London, W.C.1.

September 18—Burma.—Union Purchase Board for 300 6-volt 17-plate and 100 6-volt 19-plate BATTERIES. Tenders to the Director-General, Union of Burma Purchase Board, St. John's Road, Rangoon. (ESB/21484/58.)

September 19—Union of South Africa.—South African Railways for two four-wheeled pneumatic-tired heavy INDUSTRIAL TRACTORS for towing aircraft and two MECHANICAL SWEEPERS for use with the tractors. Photocopies of tender documents from Export Services Branch, B.O.T., price 9s. (ESB/21186/58.)

September 22—Burma.—Union Purchase Board for 15 sets 5.20-13 four-ply TYRES and TUBES and 24 sets 1000-20 16-ply TYRES and TUBES. Tenders to the Director-General, Union of Burma Purchase Board, St. John's Road, Rangoon. (ESB/21901/58.)

September 24—Korea.—International Co-operation Administration for about 35 unlined welded-steel 10,000-gal. standard-gauge TANK WAGONS. Tenders to the Office of Supply, Government of the Republic of Korea, Seoul. (ESB/21770/58/ICA.)

September 25—Pakistan.—International Co-operation Administration for quantities of TYRES and TUBES of various sizes. Photocopies of tender documents from Export Services Branch, B.O.T., price 9s. (ESB/20704/58/ICA.)

September 26—Federation of Rhodesia and Nyasaland.—City of Salisbury for four 15-18 cu. yd. refuse vehicles with rear loading and hydraulic tipping gear and 5- or 6-seat cab. Tenders to the Town Clerk, City of Salisbury, P.O. Box 990, Salisbury, Southern Rhodesia. (ESB/15277/58.)

Export Opportunity—Cuba.—Gilbert Distributors of Cuba, S.A., Paseo de Martí 114, Havana, wishes to get into touch with United Kingdom manufacturers of industrial diesel engines up to 50 h.p. (ESB/18725/58.)

## SHIPPING and SHIPBUILDING

## V.H.F. Radio-Telephone

TOGETHER, Mr. Ernest Marples, the Postmaster General, and Viscount Simon, chairman of the Port of London Authority, last week inaugurated a new V.H.F. public ship-shore radiotelephone service. On the G.P.O. stand at the Radio Show at Earls Court, Mr. Marples received the first telephone call on the service from Lord Simon aboard the yacht *Elettra II* cruising in the Thames estuary. She is owned by the Marconi International Marine Communication Co., Limited. The new service will enable suitably equipped ships within about 40 miles of the Post Office coast radio station at North Foreland to contact any telephone subscriber in the United Kingdom. It will be particularly useful for ships entering or leaving the Thames or passing between the North Sea and the Strait of Dover. The service will be open to both British and foreign ships, and can be used by passengers and crews. Further V.H.F. services are planned for 1959 at the existing coast radio stations at Niton (I.O.W.), Humber (Mablethorpe) and Lands End.

## Newsprint Ships Change Hands

WITH the termination of its operations as importer and distributor of newsprint at the end of this year, the Newsprint Supply Co., Limited, has made over the four ships owned by its subsidiary, Barberrys Steamship Co., Limited, to new owners, British International Paper, Limited. A new company, it is reported, will probably be formed to continue the ships in the newsprint trade, but their management is expected to remain in the hands of Runciman (London), Limited.

## New Cargo Container Service

THE Matson Navigation Company has started a weekly cargo container service between California and Hawaii; the first of three specially converted Matson cargo vessels has left San Francisco for Honolulu, loaded with 20 of the 24-ft. long 40,000-lb. capacity aluminium vans. A feature of the service is that many types of general merchandise and foodstuffs may be shipped in the containers, which are sealed to prevent exposure en route. The containers are loaded aboard ship by specially built cranes. While present containers are carried only on the decks of these vessels, the company plans eventually to convert ships to carry the vans below as well as above deck. Matson has ordered from a manufacturer a total of 350 containers and 275 container chassis.

## American Gas-Turbine Ship Operation

FULL satisfaction is reported with the operating performance of the American General Electric power plant of the gas-turbine ship *John Sergeant*, by Mr. Clarence G. Morse, chairman of the Federal Maritime Board and maritime administrator of the U.S. Department of Commerce. From the time of conversion in September, 1956, to April, 1958, the gas-turbine and controllable-pitch propeller have operated some 4,700 hr. Normal operation has been at 6,000 shaft horsepower or better, giving average speed slightly in excess of 16 kt. where sea conditions permitted. The original Liberty ship

speed was 10 kt. under the same conditions. The *John Sergeant* is the third of four wartime Liberty ships converted under a programme to determine the most economical types of propulsion to upgrade these 10-kt. emergency standard vessels (of which the U.S. Government still has some 1,400) and to test advanced forms of propulsion for the American merchant marine. It is said that its operation to date proves that the favourable overall fuel economy of the installation and its low maintenance record challenge the established position of modern steam turbine propulsion.

## Newfoundland Ferry Story

THE ferry arrived at Port Aux Basque, Newfoundland, last month more than three years overdue. The *William Carson* was built for Canadian National Railways at a cost of nearly £4 million to carry cars and passengers from North Sydney to Port Aux Basque, a distance of 100 miles. After it was completed it was discovered that the ferry was too big to enter Port Aux Basque, and for the past three years it has been used to carry cargo to Argentina. Improvements to the harbour at Port Aux Basque are still uncompleted but a series of test runs has begun. If they are successful, regular service to the port may start about October 1.

## Hydraulic Fender Tested at N.P.L.

AN hydraulic fender, invented by Mr. K. W. Hopkins of the B.P. Tanker Co., Limited, and Captain W. M. Hutchison, who recently retired from the position of chief marine superintendent of B.P. Tanker, has been tested successfully by the National Physical Laboratory. The fender, which is designed to replace the usual wooden baulk backed with rubber, incorporates a cushioning arrangement of one or more liquid-filled cylinders, usually fixed horizontally to a frame under the jetty below water level, although they may be positioned on the jetty itself. The cylinders have a number of ports, or holes, to allow entry or escape of liquid and are fitted with pistons. The impact of a ship on the fender causes the pistons to displace oil in the cylinders, while continued pressure causes some of the ports to be covered and so increase the resistance offered by the fender.

## NYLON EXHIBITIONS

## Industrial Applications by I.C.I.

THE plastics division of Imperial Chemical Industries, Limited, is organising three exhibitions in September and October to illustrate the industrial uses of nylon. Most recent applications in the automotive, electrical, mechanical and marine fields will be illustrated. The exhibitions, which will be seen in Birmingham, Cardiff and Glasgow, will feature mainly components produced by injection moulding, but a number of articles produced by extrusion and other techniques will also be on show.

The first exhibition will be held in the Chamber of Commerce Assembly Room, Birmingham, on September 23 and 24, the second at the Angel Hotel, Cardiff, on October 14 and 15 and the third at the Grand Hotel, Charing Cross, Glasgow, on October 29 and 30.

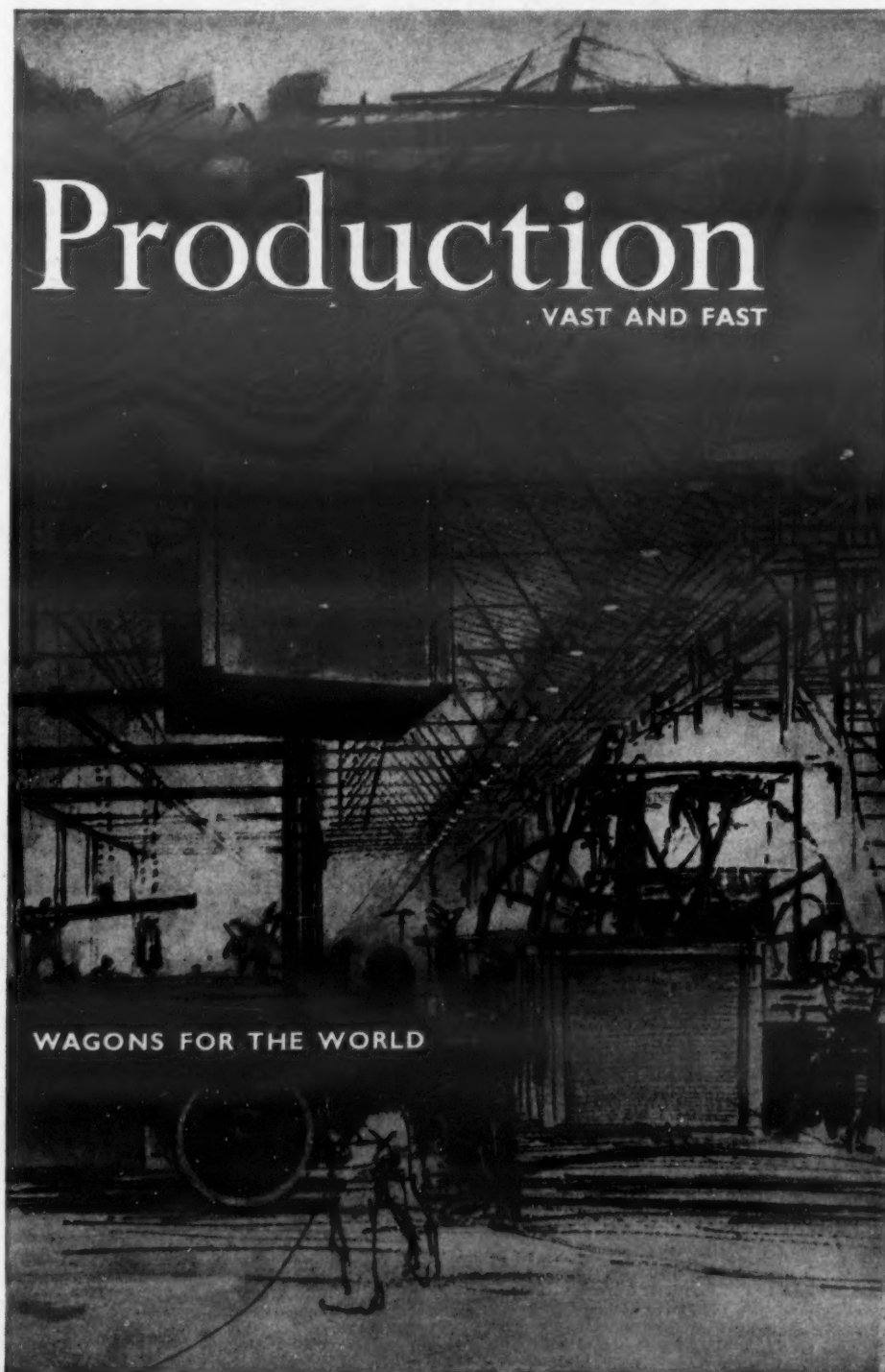
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## SOCIAL AND PERSONAL

### The Late Sir Frederick Yapp

WE regret to record the death on September 5 of Sir Frederick Yapp, chairman of Vickers-Armstrongs, 1944-46. He joined Vickers, Son and Maxim in 1902 and finally retired from the group board, on which he served from 1946 as a non-executive director, in 1951. He was 78 years of age.

We announce with regret the death of Mr. Samuel Thomson, a director of Colvilles, Limited, and a former president of the Iron and Steel Trades Employers' Federation.

Mr. A. P. M. Purdon has been appointed operations study manager in charge of central operational research and work study for the British Oxygen Co., Limited.

Mr. Ellis L. Armstrong, Utah State Director of Highways, has been named Commissioner of the Bureau of Public Roads in the United States.

Mr. H. R. Lane, for many years chief engineer of Southdown Motor Services, Limited, until his retirement at the end of August, has been retained by Pinchin Johnson and Associates, Limited, in an advisory capacity to its home sales division.

Mr. C. R. Atkins, O.B.E., stores superintendent, Scottish Region, British Railways, retired on August 31. He entered the service of the L.N.W.R. at Crewe in 1913, in the department of the mechanical engineer, later transferring to the stores department; later he served with H.M. Forces in



Mr. C. R. Atkins

France, Flanders and India from 1915 until 1919. On the formation of the stores section of the L.M.S.R. stores superintendent's office at Euston, in 1923, Mr. Atkins was transferred there from Crewe. He subsequently joined the Royal Engineers, Transportation Branch, in 1940 and was posted as staff captain to the War Office on Transportation Technical Supply, subsequently being promoted D.A.D.Tn. (Stores) and afterwards taking command of No. 1 Tn. Stores Group R.E. He was awarded the O.B.E. (Military) for services in N.W. Europe and work in connection with the rehabilitation of German railways. Mr. Atkins, demobilised in July, 1945, took up the appointment of deputy divisional storekeeper, Northern Division, L.M.S.R., Glasgow. In 1948 he became assistant stores superintendent, Scottish Region, and in 1949 stores officer, Scottish Region, redesignated stores superintendent in 1954.

Mr. P. Liddell has been appointed general manager of the Dunlop Rubber Co. (Indonesia), Limited.

Detailed plans are in hand for the Association of British Travel Agents convention at Torquay on October 18 to 22. There will be business sessions devoted to road, air, railway, hotels and shipping services and to tourism generally.

The Court of the Worshipful Company of Coach-makers and Coach Harness Makers has elected the following officers for the ensuing year: Master, Mr. R. J. D. Smith; Senior Warden, the Hon. Denis Berry; Renter Warden, Sir Reginald Verdon Smith; Junior Warden, Colonel G. A. Norris.

We record with regret the death, at the age of 44, of Mr. A. B. Davidson, A.M.Inst.T., joint managing director of Corona Coaches, Limited, Sudbury, Suffolk. It will be recalled that he purchased the Corona business in 1956 with Messrs. E. N. Osborne and J. A. B. Hibbs.

For the first time the Atlantic Steam Navigation Co., Limited, which operates the Transport Ferry Service between Tilbury—Antwerp and Preston—Larne, has appointed a fleet commodore. He is the senior master, Captain C. E. Tanner, since 1948 in command of the *Empire Baltic*, operating between Tilbury and Antwerp.

The Newcastle and Sunderland motive power districts of the North Eastern Region will be combined under the district motive power superintendent, Newcastle, as from September 15 when Mr. H. Bell, district motive power superintendent, Newcastle, will also take charge of the former Sunderland motive power district.

Mr. L. H. Cannon, A.M.Inst.T., deputy transport manager, Eastbourne Corporation, since 1948, has been appointed transport manager in succession to the late Mr. John Atherton. Mr. Cannon, who was born and educated at Eastbourne, worked in a solicitor's office on leaving school, and then joined the borough treasurer's department. He joined the transport department in 1920.

Now on a visit to Great Britain are Mr. H. C. Sawyer, establishment officer in charge stores department and Mr. J. O. Awodipe, assistant establishment officer, both of the Nigerian Railway Corporation. They are members of a party of nine executives from abroad who are taking part in an eight-week group tutorial organised by the Industrial Welfare Society. The aim of this is to facilitate the exchange of experience between people of different countries by giving them a first-hand insight into personnel, welfare and training schemes operating in the more progressive industrial organisations in Britain.

### Ministry of Transport Appointment

THE Minister of Transport has appointed Mrs. Alison Munro to be Under-Secretary of the Air Services and Civil Aviation International Relations Group of Divisions of the Department in the place of Mr. M. M. V. Custance, who was appointed a Deputy-Secretary on August 1. Mrs. Alison Munro, after serving in the Ministry of Aircraft Production as Private Secretary to Sir Robert Watson-Watt from 1942 to 1945, transferred to the Ministry of Civil Aviation as a Principal in that year. After working mainly on aerodrome planning she was appointed Assistant Secretary in May, 1949, and has been successively in charge of an Air Services Division and the Railways and Inland Waterways Division.

Mr. W. L. Baker, manager of the metal finishing division of the Pyrene Co., Limited, retired on September 1.

Mr. E. C. Taylor, A.C.I.S., pay-rolls officer, London Transport retired on September 6 and is succeeded by Mr. N. G. Robins.

Mr. W. G. ("Bill") Goff, personnel manager at Fort Dunlop for the Dunlop Rubber Co., Limited, since 1945, retired at the end of August after 44 years with the company.

Birfield Industries, Limited, announces the appointment of Mr. G. W. Kelland, A.M.I.Mech.E., Assoc.Inst.T., editor of *Transport Journal* since 1953, as public relations officer of the Birfield Group as from October 1.

The Institute of Transport Berks, Bucks and Oxon section will have as chairman for the session 1958-59 Mr. A. E. Smith (Smith's Coaches, Limited). The vice-chairmen are Messrs. W. J. Mayo and C. O. T. Purcell, the hon. treasurer Mr. W. J. Evans.

The Minister of Transport has appointed Sir Leonard Sinclair to be a part-time member of the British Transport Commission. Sir Leonard Sinclair has been chairman of the Esso Petroleum Co., Limited, since 1951. He is also a director of the Eagle Star Insurance Co., Limited.

We record with great regret the death of Mr. E. Addis, manager of the mileage division of the Goodyear Tyre and Rubber Co., Limited, which he joined in the early thirties direct from the R.A.F. He is particularly well known in bus operating circles.

Sir Philip Warter, chairman of the Southern Area Board, on September 8 sent a message of thanks to the thousands of the Southern Region's staff who helped restore and run services after the weekend's storm havoc—"the worst peacetime weekend in its history," he said.

The second Historic Commercial Vehicle Club Rally is to be held at the A.E.C. Works, Southall, on Sunday afternoon, September 28. Many hitherto unseen vehicles will be participating, it is stated, and five ex-L.G.O.C. buses will be there, too. Entry forms are available from Mr. A. Ingram, Flat 4a, 69 Hornsey Rise, London, N.19.



London area traffic supervisor for the Goodyear Tyre and Rubber Co. (Great Britain), Limited, Mr. J. McMillan was the first man to complete 45 years with the company. He retired last month. Mr. McMillan is seen here receiving his 45-year service pin from Mr. A. S. Bishop, chairman of the Goodyear board, at a dinner to mark his retirement.

The standard of floral display in railway station gardens in the North Eastern Region of British Railways was again very high and in this year's competition for the best-kept station gardens six stations qualified for special class awards, the same number as last year. Beverley has gained its fourth successive special whilst Middleton-in-Teesdale, Stockfield and Wetherall have now performed a hat trick of specials. First-class awards were given to 23 stations, second-class to 42 stations, third-class to 75 stations, and certificates of commendation to 16 stations.

London Transport announces that arising from the retirement of Mr. J. Schofield, works manager (trolleybuses), Mr. J. W. Wicks, works manager (buses and coaches), in addition to his present responsibilities, assumed overall responsibility for the trolleybus works as from September 8. Mr. A. R. Purves, engineering superintendent (road services), will, in addition to his present duties, be responsible to Mr. Wicks for the day-to-day operation of the trolleybus works and will be styled engineering superintendent (road services) and works superintendent (trolleybuses). Titles of other officers and principal executive assistants in the department now take "road services" as a suffix.

British Road Services has selected 20 candidates to take part in the 1958 cadet training scheme. This provides for two years' special training to assist candidates to qualify for promotion to higher administrative, managerial and supervisory grades, and is open to members of B.R.S. staffs and university graduates. Cadets will receive individual training at various levels of the organisation and emphasis will be placed on practical work. The training programme will include experience in general haulage; parcels yards; loading banks; traffic operation; office routine; accountancy; repairs and maintenance. The first six months of training are probationary.



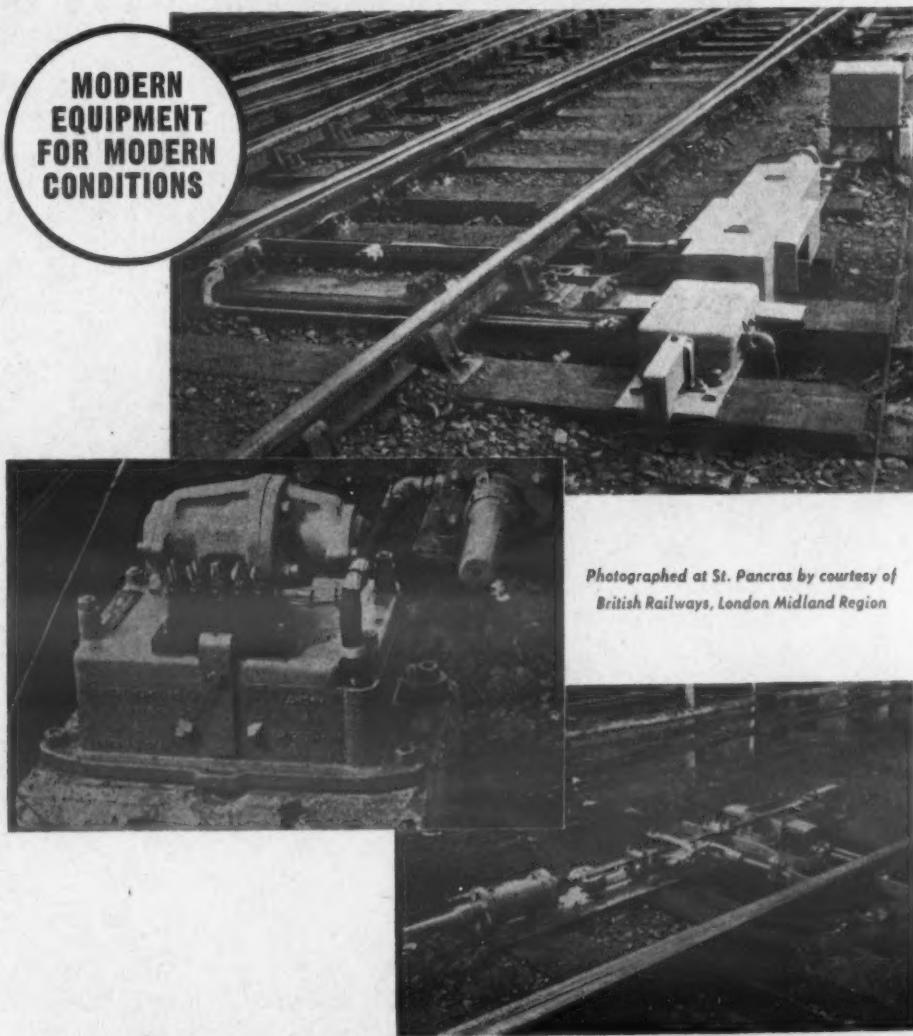
SOUTH AFRICAN RAILWAYS are justifiably proud of the Blue Train. It provides a standard of railway travel luxury unequalled anywhere. The 1,000 mile journey from Cape Town to Johannesburg/Pretoria is a genuine pleasure trip in air-conditioned comfort. Relaxed in the deep armchairs of the club car you may spend pleasant hours in conversation with your fellow travellers or viewing the vast South African scene as it rolls past your window in all its splendour. Appetising meals deftly served in a well appointed dining car and exceptionally comfortable sleeping quarters with a nearby showerbath provide the final touches to this luxury hotel on wheels. But the Blue Train represents only one facet of the service provided by South African Railways. A widespread network conveys travellers from point to point with comfort and despatch and transports immense quantities of goods from inland centres to the ports and from the ports to industries and communities far in the interior.

## SOUTH AFRICAN RAILWAYS

Information regarding the facilities offered by South African Railways will be gladly supplied on application to the

COMMERCIAL REPRESENTATIVE, SOUTH AFRICA HOUSE, LONDON, W.C.2 • TELEPHONE: Whitehall 4488

### MODERN EQUIPMENT FOR MODERN CONDITIONS



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### WESTINGHOUSE

## ELECTRO-PNEUMATIC POINT LAYOUT

incorporating the POINT VALVE STYLE D using intrinsically safe circuits, and with—

- Cut off valve for air economy.
- Soft sealed valves for efficiency.
- Magnets immunised against 50-cycle A.C. Traction
- Constant detection of the energised operating magnet.
- Emergency operation by key—thus avoiding interference with operating magnets.
- Plug-coupled wiring for ease of replacement and disconnection of wiring during emergency working.

and

### Latest point movements with

- Hardened steel faces and bushes to minimise wear.
- Eccentric bushes to adjust for wear.
- Straight connections.
- Even-sided operating cylinders.
- Non-interchangeable air connections.
- All-over lightweight cover.

Westinghouse Brake and Signal Co. Ltd., 82 York Way, London, N.1

Associated in India with  
Saxby & Farmer (India) Private Ltd., Calcutta  
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Associated in South Africa with Westinghouse Brake & Signal Co. S.A. (Pty.) Ltd., Johannesburg  
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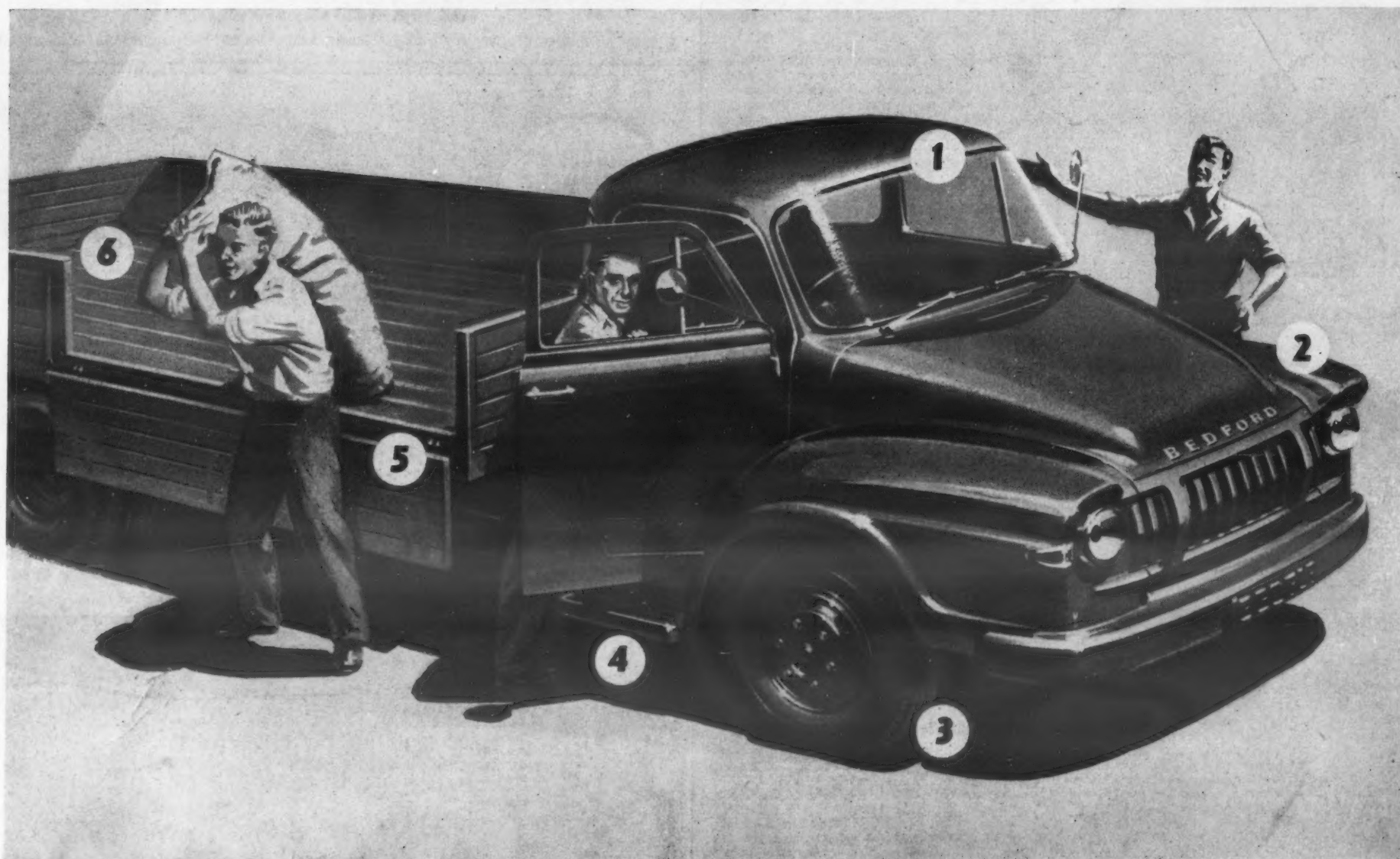
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Here's a great new range of normal control Bedfords . . . 25 cwts to 8 tons, bulldozer-tough and as manoeuvrable as a lightweight. Here are trucks built for easier loading, better vision and greater comfort; trucks built to give efficiency and economy all the way; trucks *built to last*.

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petrol and diesel. Make a date to see the low-loading 4-tonner . . . the 179" wheel-base 7-tonner . . . the rugged 6 cu. yd. tipper with 10" flat-top frame. Every model in this fine new range is a winner. And there are just as many outstanding trucks in the Bedford *forward* control range too. Your local Bedford dealer will be delighted to give you more details.

**all ways  
better!**



This is the brand new Bedford 4-tonner, a low-loader without speed or distance penalty. 15,000 lb. g.v.w.; heavy-duty frame, springs and rear axle; narrower wings; 16" step height; 7" lower load-line. Diesel Chassis £817 plus £187.6.7 P.T. Petrol Chassis £692 plus £156.1.7 P.T. Lowest cost-per-mile 4-tonner on the road.

## Features of the new range

- 1 Better Visibility All Round.** Down-swept bonnet. 63% increase in screen area. Rear quarter lights. No blind spots.
- 2 Easier Handling.** Wider vision, smaller turning circles. Extra freedom in traffic and tight loading bays.
- 3 Reduced Tyre Costs.** 16" tyres on models up to 4 tons. Tests show tyre costs per ton-mile cut by one-third.
- 4 Less Fatigue.** Low step height. Finger-light steering. Car comfort for three.
- 5 Lower Load-Line.** Easier loading. Lower centre of gravity. Greater stability.
- 6 On Heavier Models.** More powerful brakes. Close-ratio synchro-mesh gearbox. Bedford 2-speed axle. And many other Bedford leadership features.

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